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ABSTRACT

This career-based mathematics text book was written for eighth grade students by eighth grade students at Wiscasset Middle School, Wiscasset, Maine. The text has an innovative format and features interviews with various townspeople of Wiscasset concerning their occupations; from the interviews, information is presented about training needed, working hours, working conditions, likes and dislikes, and salary earned. Twenty-nine occupations are profiled in the text. They include administrator, architect, art teacher, company president, chemical engineer, clerk, dentist, doctor, press shop owner, fisherman, guidance counselor, lawyer, news editor, nuclear engineer, nurse, plumber, police officer, potter, principal, psychologist, real estate agent, recreation director, restaurant owner, secretary, tax collector, therapist, travel agent, veterinarian, and waitress. Following each interview are mathematics problems such as might be encountered by persons in that field. The mathematics problems are supplied in the form of thought (word) problems. Additional miscellaneous problems are given at the end of the text. (KC)

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ED217189 - CE 032 673

PROJECT MATH - CO

Career based Math Text Book produced entirely by eighth grade students at Wiscasset Middle School

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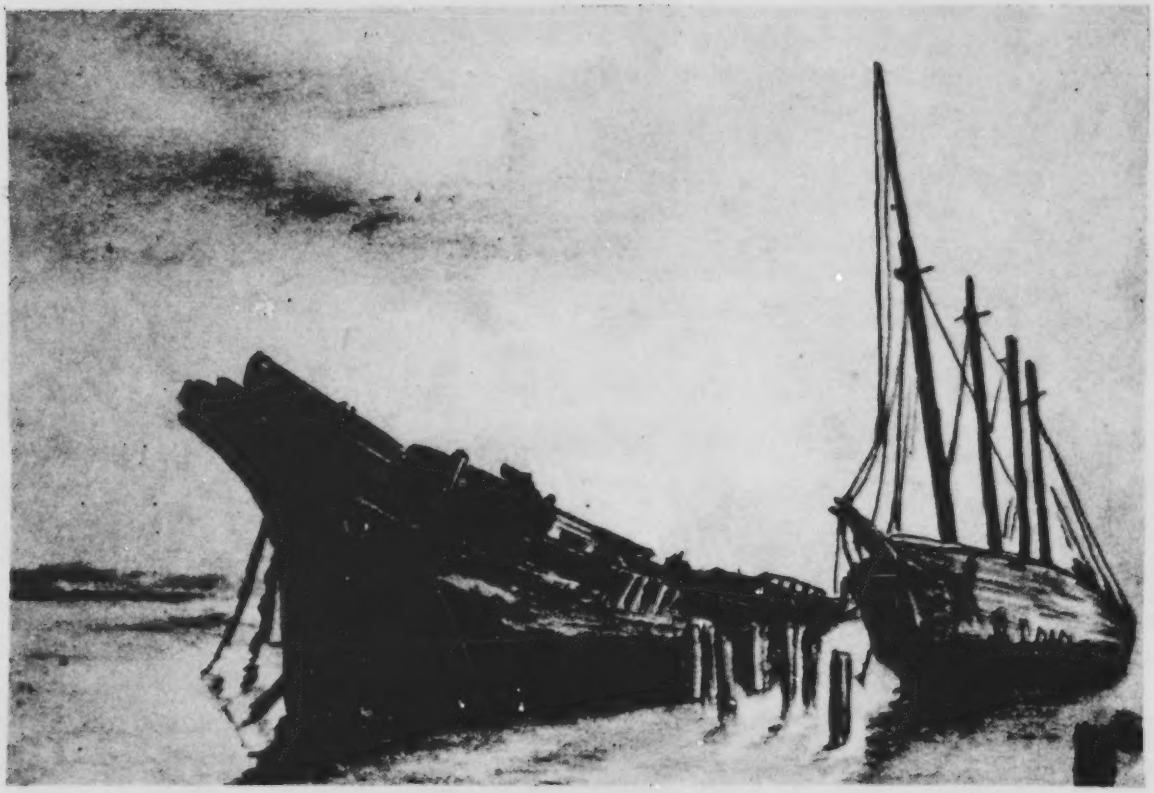
COVER PHOTO: *Front Row L to R:* Pam Sproul, Jane Manson, Tori Jones, Lisa Schmal, Cindy Cumming, Tina Meservey. *Row Two:* Sue Barth, Tanya Bickford, Anne Proctor, Debbie Koughan, Abby White, Laurie Donavan, Alicia Howard, Melissa Jones, Karen Asdot, Wanda Pearson, Debbie Grover. *Row Three:* Eric Stram, Don Moon, Dave Greenleaf, Paul Green, Steve Cromwell, Dale Hodgdon, Mike Haskell, George Dodge, Kevin Jordan. *Row Four:* Mark Bodmer, David Tonry, Greg Sutter, Warren Cossette, Randy Rogers, Jeff Santos, Danny Crocker, Tom Deiley, Chris Hobbs. Absent when photo was taken - Jeff Emmons, Jenny Fisher, Rick Owen, Mark Lorentsen.

WISCASSET, MAINE



HESPER AND LUTHER LITTLE

☆☆The Hesper and Luther Little, the two schooner hulks before you in the Sheepscot River, are purported by some to be the two most photographed ships in the world. The Luther Little, which still bears its four masts, was constructed in Sommerset, Mass. in 1917, and the Hesper was built in South Somerset one year later. Between the two ships, both coal and lumber were transported from U.S. eastern ports for trade in Haiti, Lisbon, Central and South America, France and England. Each vessel represents a history of seafaring peril and misfortune which necessitated their being auctioned by a U.S. Marshall in 1932 to settle claims against them. They were each purchased for approximately $600.00 by an Auburn, Maine man who intended to use them for hauling lumber from Wiscasset to Boston and New York. The depression intervened putting a halt to their revitalization and destining them to their final resting place as a reminder of and tribute to the days of schooner trade.

It is also fitting that Wiscasset's river banks provide these vessels their graves as Wiscasset was once a prosperous international port of trade with its naturally deep Sheepscot River bed providing a navigable waterway for ocean faring vessels like themselves.

WISCASSET MIDDLE SCHOOL
WISCASSET, MAINE
04578
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ROBERT T. PAUL
PRINCIPAL

MICHAEL DONAHUE
GUIDANCE DIRECTOR

April 16, 1981

It was with a great deal of pleasure that I read the Math Book which has been written by eighth grade students. The project has been a most worthwhile venture for many reasons. The students were exposed to a variety of careers, problems encountered in these careers dealing with math, having the opportunity of seeing these people at the place of their employment, listening to the advantages and disadvantages of each vocation, and the like.

The students handled themselves in a most mature manner and took this project very seriously. The commitment shown by the majority of the students in producing this book is most outstanding. I am sure the rewards for producing such a book will be very difficult to measure. This has been a venture these students will long remember and will feel good about themselves for having been a part of it.

The dedication and direction given by Mr. Donahue and Mr. Woodcock should not go without mentioning. Without this dedication and direction the finished product would be somewhat questionable. I am certain each student working on this project would join me in thanking these two dedicated men for all the help they have given to make this project the success it is.

Robert Paul

5

We Are An Equal Opportunity Employer

The Math Co. Project was created, initially, to achieve two basic goals. First, we had a desire to broaden career horizons and familiarize our students with a number of career possibilities. Secondly, we wanted our students to see the important role math plays in these careers, as well as giving students the opportunity to solve realistic word problems.

In the process of creating this book, our goals became broader. We wanted to involve as many eighth grade students, of varying writing and math abilities, as possible. It was our goal to have these students improve their communication skills through interviewing and writing. It was our intent to have students assume the responsibility of carrying through a project that has as its end result the math book you are now reading. This book has been prepared by students, for students and will be used as a math text book in years to come. It is important to note that in this process you might find spelling, usage, typing or grammatical errors contained herein. Please bear in mind that this book was created by eighth grade students.

Obviously, a project such as this needs the cooperation of many people. We wish to thank particularly Mrs. Chase for her typing, Miss Dresser and Mr. Hilton for reviewing material in their English classes, Mr. Paul, our principal, and the remainder of the grade 7 and 8 staff for their tireless cooperation. Thanks go to Miss Schacht and her Wiscasset High School students for final proofing and typing. We give special thanks to those students who chose to give up countless hours of their spare time to produce this book. We have found it to be an exciting project and we hope you find the contents stimulating, realistic and useful.

Mike Donahue

Mike Donahue
Guidance Director

Gary Woodcock

Gary Woodcock
Math Teacher

The World of Work

Jane has always had a talent for fixing things. Her brother knows it, too. When something breaks down, she's the one he goes to. Jane likes working with tools. And if she can't come up with the right tool for a job, she's clever enough to improvise.

Jane's talent could lead her to some interesting careers in repairing and maintaining equipment. She could work as a mechanic, a machinist or an electrician. She might even go on to become an engineer.

Of course, just how far Jane's talent takes her will depend on how far she takes her education. And how well she does in such subjects as shop, math, science and English.

Chances are, the things you like to do can lead to a job you'll like.

If you'd like to find out how, talk to teachers and counselors. They'll suggest courses you should take. They'll give advice about colleges or technical schools following high school.

If you must get to work early, they'll tell you about companies that have apprenticeship programs and other on-the-job training so you can continue your education while you're working.

After that, it's up to you to work hard at whatever you do.

If you want more career ideas, write for our free booklet, "What's It Like to Be a Technician?" Write to: General Electric, Dept. G2, Fairfield, CT 06431.

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Corporation President

by Paul Green
Jenny Fisher
Rick Owen

JOHN F. SULLIVAN, JR.
President
and
Chief Executive Officer

We spent twenty minutes interviwing Mr. John Sullivan, President of Bath Iron Works. He is a very busy man who has a very impressive office; he serves as the head man for the entire operation of B.I.W. Mr. Sullivan talked about how the shipyard works from designing a boat and getting contracts to the cutting of metal and finally the final products. B.I.W. has a very successful record of producing quality ships usually well ahead of deadlines. One of Mr. Sullivan's big jobs is making sure the shipyard has sufficient contracts for the future. They have contracts now through the mid 1980's and are presently working on the design and contracts for the sea barges. The U.S. Navy is B.I.W.'s biggest customer. Mr. Sullivan also talked about the apprentice training program where people are trained in specific skills like welding, electricity, carpentry, sheet metal, pipe fitting, boiler mechanics and electronics. During the three year program the workers are paid a very good wage working 30-35 hours a week and going to classes 5-10 hours per week. We are all amazed at how big a place B.I.W. is especially the crane, the largest in the western hemisphere. The only that is bigger in the world is the one that loaded it on the boat in Japan. B.I.W. employs lots of people, close to 6,000 which makes it the largest employer in the state of Maine . Mr. Sullivan in the talked about

the resonsibility of managing a place this big and told us he uses management by objectives technique and has excellent people working for him in administration. His two assistants were very helpful and they gave us lots of math problems. Mr. Sullivan seemed like a very nice guy who has a very important job. We all enjoyed spending time with him and learning about B.I.W.

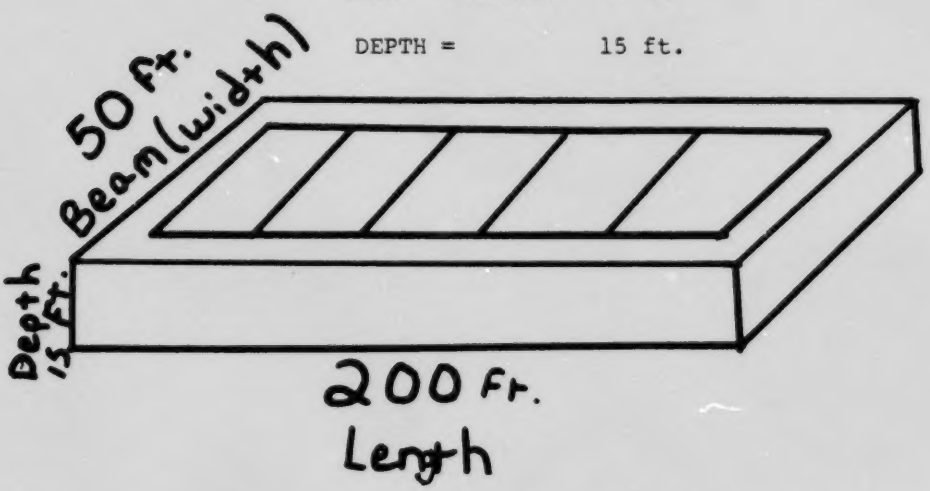
MATH PROBLEMS

A shipyard has contracted to build a barge with the following dimensions:

LENGTH = 200 ft.

BEAM = (width) 50 ft.

DEPTH = 15 ft.



1. What is the surface area of the following parts in square feet?

   a. Sides

   b. Top

   c. Bottom

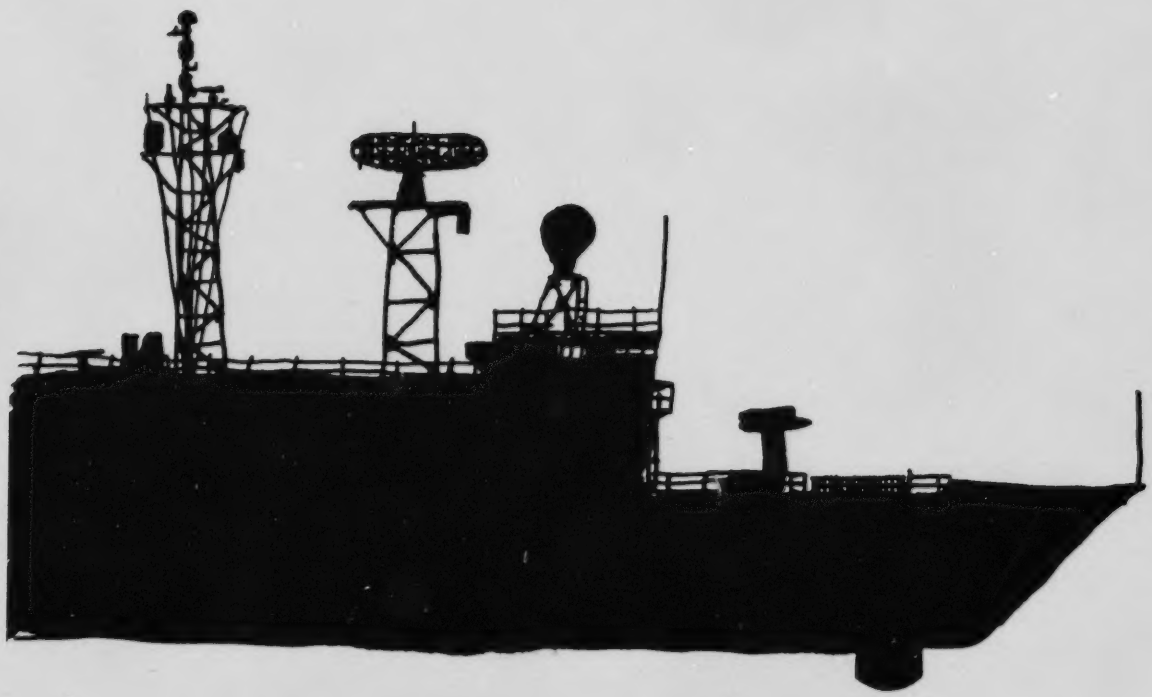
2. What is the total area of the barge in square feet?

3. IF the barge is mad of steel and the average weight if the steel is 30 ponds per square foot, what is the total weight of the barge in pounds?

4. In order for the barge to float, it must displace water exactly equal to its weight. How many pounds of water will be displaced?

5. The barge will float in salt water. Salt water weighs 64 pounds per cubic foot. What will be the volume of salt water displaced in cubic feet when the barge is empty?

BUILDING PATROL FRIGATES FOR THE UNITED STATES NAVY



OPERATING INCOME

BACKGROUND: In general, a business is a success if the price it charges its customers is more than it costs to produce its product. If that happens, the business will generate income. At B.I.W. our price is determined when we are awarded a contract for a given amount of money. Our total costs are the sum of labor and overhead costs and material costs.

To determine labor and overhead costs, the total time it takes to build a ship (manhours) are multiplied by a rate per manhour. To determine material costs, the costs of all items purchased are added and charged to the contract.

PROBLEM #1: B.I.W. is awarded a contract to build a ship for $20 million. It will take 1.0 million manhours to build the ship. The labor and overhead rate for each manhour spent is $10.00. The total material costs of building the ship will be $7.0 million. Will B.I.W. earn a profit on this contract? How much?

PROBLEM #2: B.I.W. is awarded a contract to build a ship for $30.0 million. It will take 1,500,000 manhours to build the ship, the material cost will be $10.0 million, and B.I.W. will generate $2,000,000 of income on this contract. What is the labor and overhead rate for each manhour spent?

RETURN ON INVESTED CAPITAL

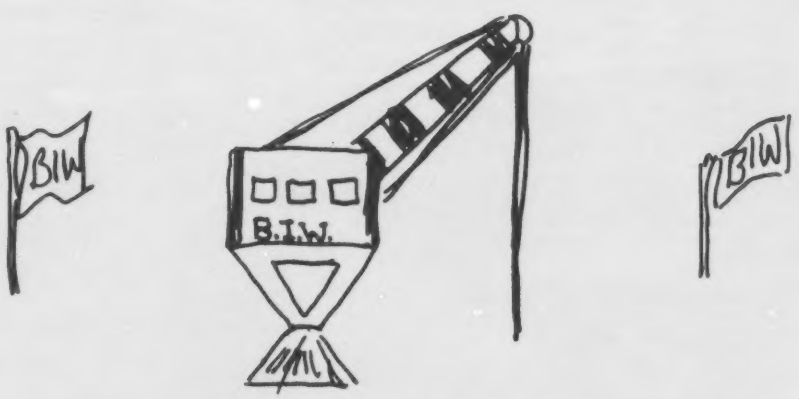
BACKROUND: In general, a business is successful if it can generate a "return on invested capital" which exceeds a minimum acceptable level.

"Return on invested capital" is calculated by using the following formula:

$$\frac{\text{Sales}}{\text{Assets}} \times \frac{\text{Operating Income}}{\text{Sales}} = \text{Return on Invested Capital}$$

PROBLEM # 1 : If B.I.W. had sales of $200,000,000, operating income of $5,000,000, and assets of $50,000,000, what was its return on invested capital?

PROBLEM # 2: If B.I.W. had an ROIC of 15% sales of $250,000,000 and assets of $75,000,000, what was operating income?



ACTUAL vs BUDGET

BACKGROUND: At the end of each year, B.I.W. prepares an Annual Budget for the next year. The purpose of this Annual Budget is to set goals for B.I.W. each year. In general, a business is successful if it meets or exceeds its Annual Budget each year.

PROBLEM # 1: Operating Income

Assume the following:

	Budget	Actual
Sales	$200,000,000	$220,000,000
Manhours	7,500,000	8,000,000
Labor & Overhead Rate	$12/Manhour	$11/Manhour
Material Cost	$100,000,000	$120,000,000

Did B.I.W.'s actual income exceed budgeted income? By what percent?

Dress Shop Owner

THE LYDIA GUTCH DRESS SHOP- MRS. JOYCE MARCO OWNER OPERATER
BY Cindy Cumming & Wanda Pearson

This is an interview about the business of a dress shop by Cindy Cumming and Wanda Pearson. The Lydia Gutch dress shop is located in downtown Bath, Maine.

Mrs. Joyce Marco and her partner realized that there was a large need for a women's personal clothing store. They have been in this business for about four years.

As for salary, they say it varies quite a bit depending upon the season, but they set their own hours and pay themselves whatever the business produces weekly or monthly.

Typical work hours are 8 to 9 hours per day five days per week. During the Christmas season they work 12 to 15 hours per day. There is always paperwork that has to be done at home.

Joyce feels that a college degree in retail sales would be very helpful to do this job well. She is quite happy running the Lydia Gutch dress shop, but if she were to choose a different career it would probably be in public relations or as a secretary.

Joyce told us about going on buying trips. She goes to Boston and picks out styles, sizes and color of the goods she feels will sell best. It's important that they have quality goods and that the selection is what the customers desire.

It was a lot of fun spending time with Mrs. Marco and seeing the Lydia Gutch dress shop. It's a neat place with lost of super clothes.

The following problems are generally of the type that Mrs. Marco needs to be able to solve.

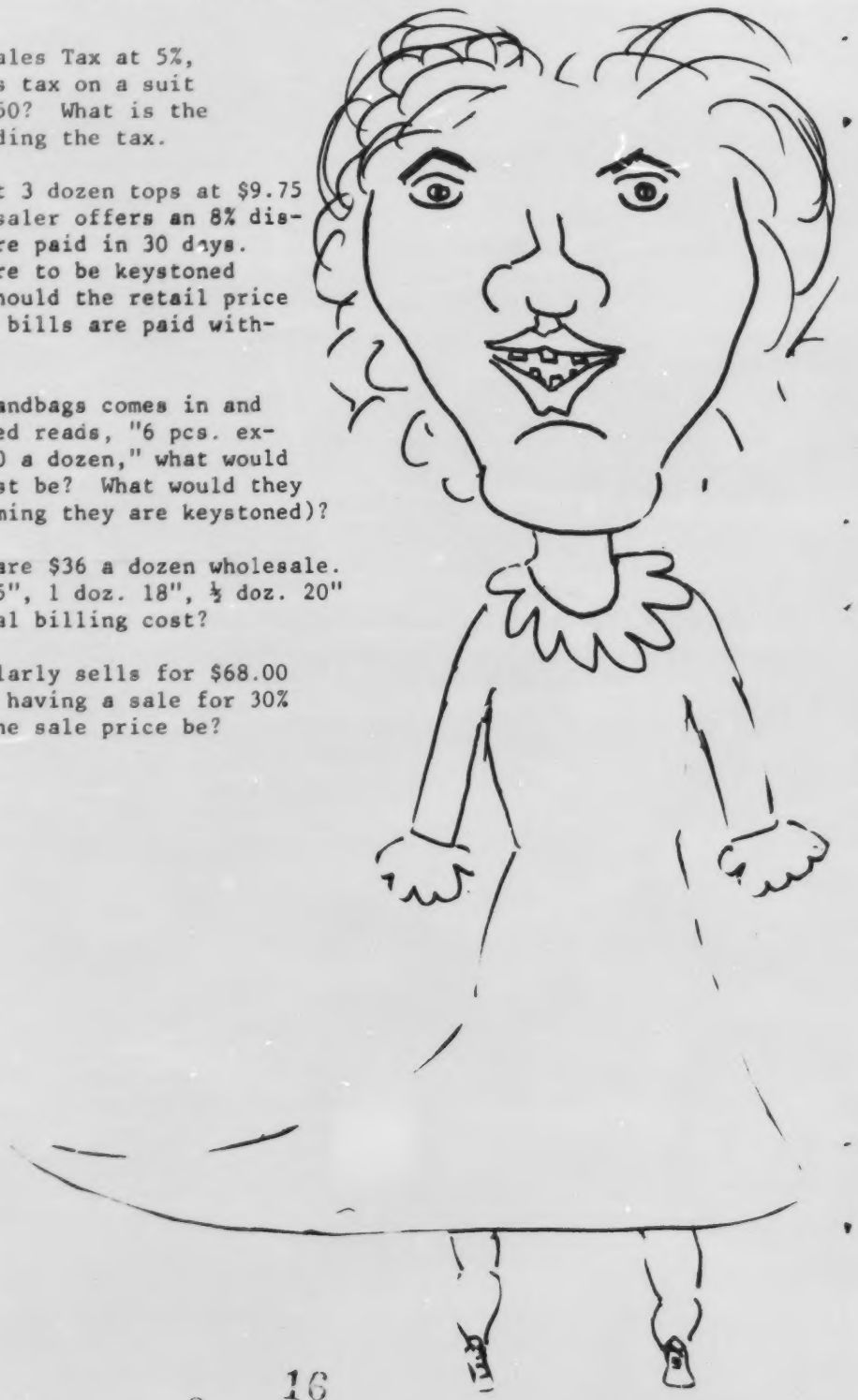
1. With the state sales Tax at 5%, what is the sales tax on a suit which costs $82.50? What is the total cost including the tax.

2. A merchant bought 3 dozen tops at $9.75 each. The wholesaler offers an 8% discount if bills are paid in 30 days. If these items are to be keystoned (double), what should the retail price be? (Assume the bills are paid within 30 days.)

3. If an order of handbags comes in and needs to be priced reads, "6 pcs. extended to $168.00 a dozen," what would the wholesale cost be? What would they retail for (assuming they are keystoned)?

4. Sterling chains are $36 a dozen wholesale. We want 2 doz. 15", 1 doz. 18", ½ doz. 20" What are the total billing cost?

5. If a blazer regularly sells for $68.00 and the store is having a sale for 30% off, what will the sale price be?



Veterinarian

by Greg Sutter Jeff Emmons

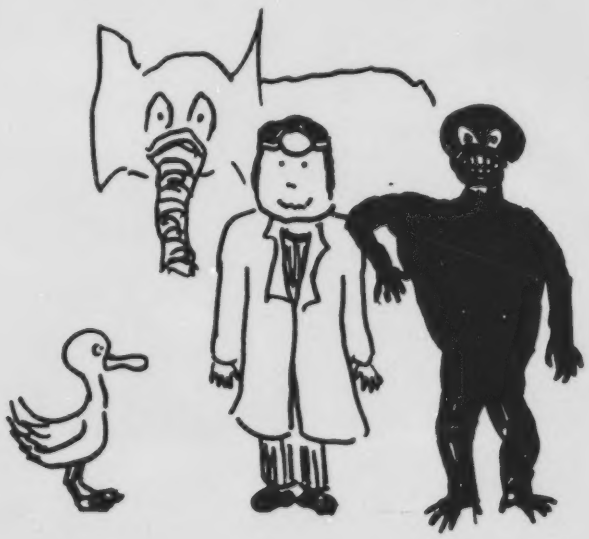
To be a veterinarian you must have four or more years of college and a great love for animals.

We interviewed Dr. Douglas Rink, D.V.M. of the Bath Animal Hospital. According to Dr Rink, the veterinary field isn't over populated, but to get into a veterinary school is very, very hard.

Dr. Rink said "It's one thing to dream about being a veterinarian, but it's totally different to be one." Dr. Rink said he had wanted to become a vet. when he was our age, but never dreamed hew hard it was going to be.

Veterinarian must attend four or more years of college, two years of pre-med, and four years of med school. "You really have to use you brain, because some of the things you learn are so elementary, they become harder as you think them through!" commented Dr. Rink, closes out the interview.

Veterinary work requires some basic, and advanced math, and involves everything from addition and subtraction, to algebra and calculus.



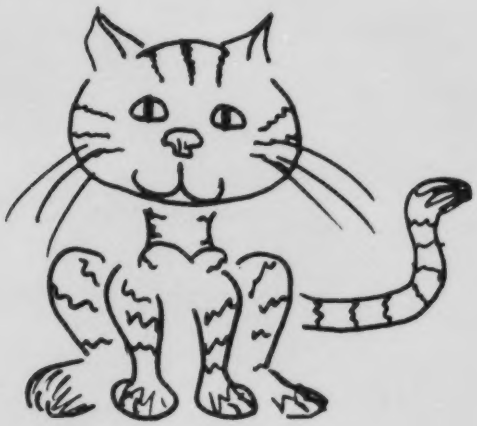
WORD PROBLEMS********VETERNARIAN

1. You wish to medicate a 30 kg dog. The proper dosage is 1 mg/kl twice daily. Each pill contains 5 mg of medication. How many pills should be given each time and how many pills should bedispensed to medicate the dog for a total of seven days.

2. It is time to reorder ear ointment. Supplier A has a special deal going on--if you buy 72 tubes, the price is $2.38 per tube. Supplier B sells the same product for $2.45 each. Company A gives a 2% cash discount and Company B gives 3%. Assuming you want 72 tubes and you always pay cash, which is the better buy?

3. Farmer Chase had his prize winning cow "Daisey" bred by artificial insemination on May 5, 1980. If the gestation period of a cow is 280 days, when will "Daisey" be a mother?

4. You need to anesthetize Mrs. Higginsworth's $10,000 stallion for minor surgery. He weighs 950 lbs. The dosage rate is 40 mg per 12 lbs. of body weight. How many mg's of a 4% (4 mg/100 ml) solution would be his calculated dosage?



Nurses Aid

by: Karen Asdot

The person I am interviewing is Janet Greenleaf. Janet works at the Bath Nursing Home. I am interviewing her because I was interested in her work.

First, I asked Janet if she does Math in her work. She said, "Yes, I do, on intake and output." Intake is how much a person drinks in a period of eight hours. One cup of any kind of liquid is considered 180^{cc}. If a person drank five glasses of water it would be 180 x 5. Output is how much a person urinates. And this is also measured in cc's, starting at 20^{cc}. This is over a period of eight hours.

The second question I asked Janet was how much money she made an hour. She said, "I work seven hours a day, five days a week, at $4.40 an hour. I clear about $136.00 weekly after tax and all are taken out."

The third question I asked her was if she liked her job and why. She said, "Yes, I do like my job. These people need tender loving care and I feel I can give this to them to make the rest of their life happy and comfortable."

Then I asked Janet whether she would rather do the job she is doing or quit and get a job somewhere else. She said that when Cathyrne dies, she is going to quit and find another job. During the week days, she only takes care of one person and that is Cathyrne. But on weekends she takes care of all kinds of people.

I asked Janet is there were some sad things in her job. She said there really wasn't any sad things except when people die.

MATH PROBLEMS-NURSE---Joanne Cromwell R.N.

1. Each year, school nurses give immunizations to pre-school and in-school students.

   A. D.P.T. (diphtheria, pertussis, tetanus) vaccine is supplied in vials containing 7.5cc. The dose for each student is 0.5cc. How many students can be immunized from 1 vial? How many vials must obtained to immunize 192 students. Give answer in whole vials.

B. Immunization for polio is given by mouth-2 drops per dose. The bottle contains 20 drops. How many bottles must be ordered for a clinic of 72 children?

C. Large measles clinics were held recently to re-immunize all school children. The vial of measles vaccine contains 5cc-the dose per student is 0.5cc. How many vials were ordered for 1040 students?

2. Covert the following heights to feet and inches.

EXAMPLE: 37 inches = 3 feet 1 inch

71 3/4 inches	72 inches	63 inches
47 inches	48 inches	60 3/4 inches
49 inches	61 inches	52 inches
68 1/4 inches	56 inches	58 1/2 inches
54 1/2 inches	70 1/2 inches	52 1/4 inches
59 inches	73 1/2 inches	50 3/4 inches

3. One student weighs 150 pounds and receives an injection of 0.9cc medication. If another student who weighs 250 pounds, is to receive the same amount of medication per pound, how many cc's will he receive?

4. Warm sodium chloride (salt) solutions are used for gargles, and for soaking infected wounds by mixing 1 teaspoon salt to 8 ounces of warm water. Using this formula, how much salt would be needed to mix with 2 1/2 quarts of warm water for soaking an infected foot?

Medical Doctor

by Sue Barth
Alecia Howard

Dr. Kitfield is a family doctor in Wiscasset. He begins his day be going to Miles Hospital in Damariscotta where he checks his patients. After hospital "rounds" he returns to his office in Wiscasset to spend the day with appointments. Many times he will do home visits, go to nursing homes, and sometimes teaches a residency program for new doctors at the Augusta Hospital. He and four other physicians work together so they can take turns on call and taking Emergency Room duty.

Some of the many tools used by Doctor Kitfield are scalpels, mosquito snaps, kelly clamps, forceps, scissors, needle drivers, suture material, breathing machines, hypercaters, liquid nitrogen, sigmoydoscope, alphalmascopes as well as things to check ears and things to sew people up.

During the basic physical, Dr. Kitfield will gather medical background about the patient. Then he checks the blood pressure, thyroid gland, eyesight, hearing, teeth, basic nutrition, heart, lung, and belly. Sometimes he gives pelvic exams, rectal exams, or neurologic exams if necessary. At times he performs minor surgery in his office.

To become a doctor, it takes four years of regular college, four years of medical school, and three years of residency training. Most doctors are between 28 and 33 when they begin a practice. Dr. Kitfield is a family physician with a private practice.

During a typical day Dr. Kitfield works 8 to 10 hours per day, and he is responsible for emergency calls 24 hours per day as well as emergency room duty at the hospital one weekend per month. For his work Dr. Kitfield makes between 30 and 40 thousand dollars a year. He has to pay all his office bills and his secretaries out of his earnings so he has to be a businessman as well as a doctor. His charge for an office visit is $15.00. He travels 20-25,000 miles per year on business. He could make more money by working at the emergency room more often or charging a higher fee, but he feels he is busy enough as it is.

For vacations he takes two weeks a year off and all the holidays. He also takes time for professional conferences. Dr. Kitfield told us he really likes his job, but for him the hardest part is doing the paperwork and emergency room duty.

Sue: "I think being a doctor is difficult work. It must be very hard to deal with death and serious illness. I admire doctors and I think they play a major part in our world."

Alecia: "I enjoyed the interview with Dr. Kitfield. He is a very hard working dedicated man. The job as a doctor is very difficult, I respect him very much."

Dr. Kitfield, of Wiscasset, was kind enough to help us in our career math book, by giving us four very excellent word problems

1. A mother called her doctor in a panic because her three-year-old daughter had just swallowed all of the remaining aspirin in its bottle. The aspirin bottle originally contained 36 tablets. She remembers giving two tablets to each of the four family members on two different occations for their cold symptoms. She found three aspirin on the floor around the baby.

   The doctor wonders if the child had consumed enough aspirin to cause her to become ill. He remembers that the toxic dosage is 500 mgm. per kilogram. The mother states that the baby weighs 13 kg. There are 300 mgm. of aspirin in each tablet.

   Did the young child consume enough aspirin to become ill?

2. A doctor saw 472 patients in his office during the month of August. He worked 18 days during that month. His bookkeeper explained that she had paid out $3500.00 that month for salaries, medical equipment, utilities, and other office expenses. His secretary reported that during that month, there had been $8000.00 worth of charges, but that she had only collected $7500.00 from the patients. The doctor was interested in the following:

   1) How many patients did he see on an average each day?

   2) How much was the average charge per patient?

   3) How much money would he have to report to the IRS as income for that month?

   4) By how much had his accounts receivable increase?

   5) What percentage of total receipts were his expenese?

EDWARD B. KITFIELD, III, M.D.
WATER STREET
WISCASSET, MAINE 04578

_____
HAS AN APPOINTMENT

DAY _____ MONTH _____ DATE _____

AT _____ A.M. _____ P.M.

PLEASE TELEPHONE ONE DAY IN ADVANCE IF YOU WILL BE UNABLE TO KEEP THE APPOINTMENT.
PHONE 882-6008

3. Bob became very sick with a serious infection in his kidney. He was admitted to the hospital where, as his physician, you must calculate the proper dosage of antibiotic to give this 80 kilogram man. You must write an order for the nurse so that she will administer the antibiotic in the proper dosage (mgm.) and at the proper interval (hours).

You have the following information to work with:

1) Bob has only one kidney. (normal number is two)

2) Antibiotics are usually given every 8 hours.

3) For every 10 percent reduction in kidney function add one hour to the administration interval.

4) Dosage is 1.0 mgm/ kilograms/ dosage.

A. _____mgm antibiotic per dose, every B. _____ hours.

4. Judy is a 20 year old girl weighing 60 kg who has just had her appendix out and is returning from the operating room to her hospital bed. As her doctor, you must calculate how much fluid to infuse into her vien over the next 24 hours.

Find the rate of administration of a solution or sugar, salt, and water in mililiters per hour given the following information:

1) She needs to produce 20 ml of urine per kilogram (body weight) per day.

2) She will perspire 15 ml of sweat per kilogram (body weight) per day.

3) She will perspire 15 ml per kilogram (body weight) per day in the area operated on.

4) She is nausated and will be allowed to take only one sip (15 ml) of fluids every two hours.

					217.80
7/8/80	Ricky	SE	16 50	—	234.30
9/4/80	Brenda	OV	20 18	—	254.98
9-1-80	Steph	IM	6 00	6 00	254.48
12-6-80	—	— ROA	—	20 00	234.48
12-18-80	Gary	OV	25 00	—	259.48
12-30-80	Brenda	OB	20 18	100 00	179.66
1/6/81	Ricky	OVB	10 00	—	189.66
1-8-81	Steph	OV	12 00	12 00	189.66
1-11-81	Gary	INJ	12 00	10 00	201.66
1-26-81	Brenda	OB	20 18	—	221.84
2-2-81	Brenda	SP	12 72	—	234.56
2-9-81	Gary	OV	25 00	20 00	239.56

MEDICAL STATEMENT PROBLEMS

1. The statement on the previous page contains <u>at least</u> one error. Make an extra Balance Column on your homework paper, and make the necessary corrections.

2. What was the total medical expenses of this family from September 1, 1980 to December 31, 1980?

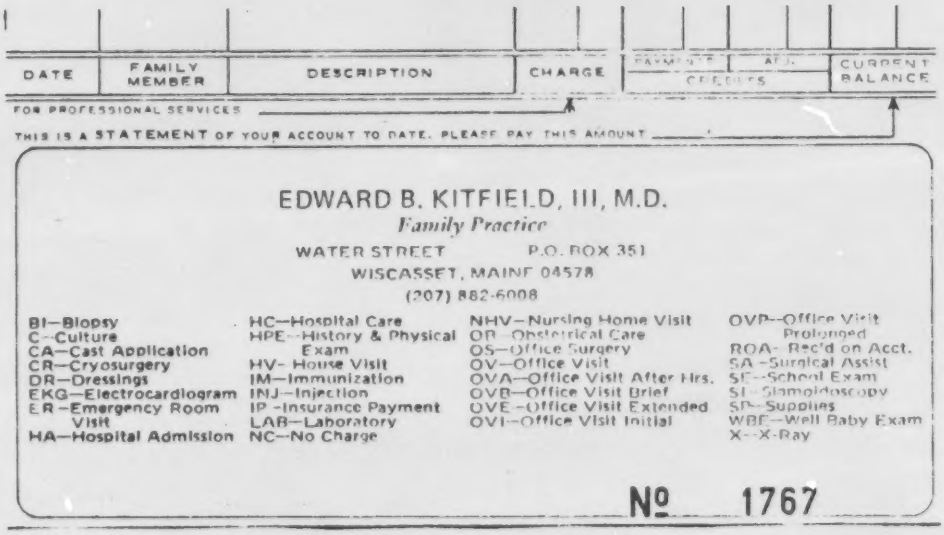
3. Explain what occurred on December 6, 1980.

4. On January 11, 1981 who went to Dr. Kitfield's, and what services were rendered?

5. If this family were to pay their total bill, and still owed Dr. Kitfield, how much would they have to pay?

6. What does "Balance Forward" mean?

7. How much did Brenda spend on Medical Services as reflected in this statement?



DATE	FAMILY MEMBER	DESCRIPTION	CHARGE	PAYMENT / CREDITS	ADJ.	CURRENT BALANCE

FOR PROFESSIONAL SERVICES

THIS IS A STATEMENT OF YOUR ACCOUNT TO DATE. PLEASE PAY THIS AMOUNT

EDWARD B. KITFIELD, III, M.D.
Family Practice
WATER STREET P.O. BOX 351
WISCASSET, MAINE 04578
(207) 882-6008

BI—Biopsy
C—Culture
CA—Cast Application
CR—Cryosurgery
DR—Dressings
EKG—Electrocardiogram
ER—Emergency Room Visit
HA—Hospital Admission
HC—Hospital Care
HPE—History & Physical Exam
HV—House Visit
IM—Immunization
INJ—Injection
IP—Insurance Payment
LAB—Laboratory
NC—No Charge
NHV—Nursing Home Visit
OB—Obstetrical Care
OS—Office Surgery
OV—Office Visit
OVA—Office Visit After Hrs.
OVB—Office Visit Brief
OVE—Office Visit Extended
OVI—Office Visit Initial
OVP—Office Visit Prolonged
ROA—Rec'd on Acct.
SA—Surgical Assist
SE—School Exam
SI—Sigmoidoscopy
SP—Supplies
WBE—Well Baby Exam
X—X-Ray

№ 1767

Secretary

by Melissa Jones and Tina Meservey

Mrs. Barbara Peters and Mrs. Jan Lee are secretaries at Wiscasset Middle School. The largest part of their work is doing work for Mr. Paul the school principal. To do their jobs, they need a high school education, be able to type well, enjoy people, and both of them have done other jobs which helps them do this job.

Both Barbara and Jan work 8 hours days five days per week and don't work any overtime. The biggest part of their job is typing, filing, and answering the phone. It's very inportant for them to be organized and also to like people because they spend a great of time with parents, students, and teachers. One of the reasons they like their jobs is that they have the same vacations as their children.

Some of the benefits of this job are 10 paid sick days per year and holidays off. They have a break every day at mid-morning and also at lunch time. Mrs. Peters and Mrs. Lee told us they both love the job because it's never the same, every day offers a new challenge and something different.

These are some typical math problems that Mrs. Peters and Mrs. Lee might have to do in a typical day on their job.

1. Total enrollment for the school is 371 pupils. In the 4th grade 31 students made the honor roll; 26 in the 5th grade; 29 in the 6th grade; 18in the 7th grade; and 33 in the 8th grade. What % made honors?

2. School pencils can be purchased for 8¢ or 2 for 15¢ and pens can be purchased for 25¢. How many can you purchase for $1.85?

3. There are 78 4th graders. 15 of them were absent Tuesday. What % of students were present Tuesday?

4. In the fifth grade there are 65 students. At the end of the ranking period, in English, 13 received A's; 26 received B's; 19 received C's; 5 received D's; and 2 received F's. What % received each grade?

5. Total enrollment for the school is 371 students. On Monday 17 pupils were absent; Tuesday 14 were absent; Wednesday 13; Thursday 9; and Friday 19 were absent. What is the average daily absence? What is the % of students in attendance on Wednesday, Friday?

Restaurant Owner

Le Garage
WISCASSET, MAINE 04578

by Laurie Donovan
Abby White

We interviewed Shep the owner of Le Garage restaurant. Shep wanted to be a teacher. She majored in Education and then went on to Oregon to look for a job. She couldn't find a teaching job, but liked the country so she stayed. She worked as a clerk in Penney's and then sold Real Estate. She then decided to move back East and sell clothes at a big store in Massachusetts. Her parents had built a restaurant in Maine and wanted to retire so Shep decided to come to Maine. It was not an easy decision for her to make, but as it has turned out, it was a good one.

The first person she hired, Alan Dodge, was an excellent chef. Many people helped and soon the restaurant was fixed up real nice and ready for business. Alan and Shep taught each other about the business. They are continually learning and listening to customer suggestions. One of Shep's biggest concerns is that people enjoy her restaurant and feel right at home while they enjoy a really well-prepared meal. She especially enjoys decorating at Christmas time.

The business has been going for four years with this being the second year of being open year round. At first they didn't have heat but now that they do, they enjoy being open, except for four to six weeks when they close during the winter. It is long work as Shep puts in 10-11 hours per day. She uses math in her job by adding up labor, pay, food, bills, etc.

Working in a restaurant takes much practice. The waitress must remember who ordered what and where they are. Lots of people apply for jobs at Le Garage, over 100 people last year applied. Summer is the most profitable time of year. They use most of the profit to heat the building during the winter. Shep doesn't order the food, the chef does most of the ordering. Lobster is a really big selling item especially during the summer. People who travel

to Maine in the summer don't get much lobster. The chef also orders over 200 pounds of Haddock per week. They have a separate baker named Trea Richardson. She makes super pies, cakes and other baked goodies.

Managing a restaurant is very hard work, but if you are like Shep and love your job, it can really be exciting.

RESTAURANT MATH PROBLEMS These are some of the typical math problems that restaurant people need to do.

Problem 1 Payroll

Peter Riley earns $3.10 per hour for the first 40 hours that he works in a week. Any hours more than 40, he earns 1 ½ times the $3.10 rate. What would his gross pay be if he works 44 1/2 hours.

Problem 2 Tips

Mr. & Mrs. Dodge ate at a restaurant. Their total bill added up to $28.60. If they wanted to leave a 15% tip, how much should they leave?

Problem 3 Ordering and Cooking

The garden club is having a luncheon at a restaurant. There will be 27 ladies in the party. They will each have 1 cup of chowder, 6 oz. of fish, 3 oz. of peas, and 4 oz. of potatoes. How many quarts of chowder, pounds of fish, peas and potatoes must the chef order and prepare?

Problem 4 Receiving Freight

A restaurant was charged $14.00 shipping charge for supplies they received. The correct rate for charging is $1.00 for every 20 pounds. Did the restaurant get charged properly if the shipment was as follows:

2 Boxes	30 Pounds
1 Crate	68 Pounds
1 Carton	54
1 Box	76
1 Sack	22

Le Garage

WISCASSET, MAINE 04578 207 882-5409

Problem 5 Menu Pricing

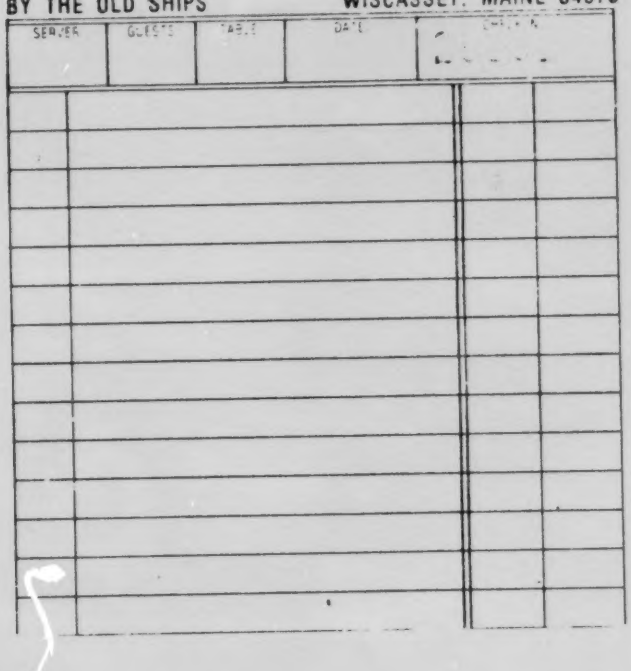
If a chef figures that he must add up how much the ingredients to a meal cost and then multiply that figure by 2 1/2 to charge enough to pay for the workers, equipment, heat, electricity etc., how much would he have to charge for a cheeseburger that costs the following:

4	oz. Hamburger	$.50
1	oz. Cheese	.16
1	oz. ketchup	.08
1	Bun	.15

Le Garage

RESTAURANT & LOUNGE

BY THE OLD SHIPS WISCASSET, MAINE 04578



Police Officer

by Tom Deiley
Joey Dalton

The first question that Joey asked Officer Foster was, "What do you do on the job?"

His reply was, "I enforce the laws of the state of Maine and of the town of Wiscasset and I also do emergency work such as at accidents, fires, and things of that nature."

His answer to our second question, "How long have you worked on this job?" was this; "I have been working with the police force for four years".

Our third question, "What do you use for tools on this job?" was met; with this reply; "The tools we use on the job are both material things and verbal things. The material things we use are radars, radios, cruisers, and for certain situtations we use guns, tear gas, vests, polygraph machines, handcuffs, and mace. A tool you would use in some situtations would just be talking to people. Others might be using the power to arrest someone or to warn someone."

Our fourth question was, "Is there special training required?" He replied, "Yes, each officer has to go through a twelve month police academy which is located in Waterville, Maine. Besides that, there is also in-service training schools which you have to take every year on different subjects in police work."

Our fifth question, "As you see it, what are some of the advantages and disadvantages to your job?" Was answered in this manner; "Some of the advantages

of being a police officer are that you are able to work outside and you don't have to sit at a desk all the time even though there is some desk duty. You get to work with the people and at times it is very exciting. Another advantage is that you get to help people who need help. Some of the disadvantages are that sometimes people get mad at you because you are enforcing the law. There is a great deal of paper work to being a police officer. A police officer may have to work nights, weekends, and holidays, where as people in other professional jobs usually have that time off.

The next question that we asked him, our sixth one, was, "What kind of an education is necessary to do this job?" His answer was, "You have to have a minimum of a high school diploma. Some agencies require a college degree. After you become an officer you need extended training at the school in Waterville and also continued education all the time every year".

Our seventh question, "How much can I expect to get paid in this field of work?" Was answered this way: "In the state of Maine a patrolman can earn anywhere from $10,000 to $15,000. If you are a sergeant, lieutenant, captain, of the chief of police, the pay is higher."

Officer Foster answered this way to our eighth question, "What jobs are available in the line of police duty?" Some of the job areas available in police work are patrolman, corporal, sergeants, lieutenants, captain, or even chief of police. A few other departments are fingerprinting, photography, and investigation."

"What are some of the positions you could advance to?" Our ninth question got this answer from Officer Foster. "If you are a patrolman, you would advance to a corporal, sergeant, lieutenant, captain investigator or even chief of police with enough work".

Our next question was, "What kind of retirement or fringe benefits are there?" He answered saying, "You are given Blue Cross/Blue Shield and Life Insurance. If you are sick, you get paid for those sick days or if you work on holidays, you get extra money called holiday pay."

Our eleventh question was, "How many hours do you work on the job?" "A normal days work covers eight hours, sometimes you might work a sixteen hour day," answered Officer Foster. We came back with, "How much do you get paid?" He said, "For the first four hours you get paid straight time and after that you get paid time and a half." We asked another question, "What kind of vacations do you get?" He answered us saying, "For the first five years, you get two weeks of vacation time. After five years of service, you receive three weeks, and after ten years, you get four weeks of vacation."

Our final question, "What is the minimum and maximum age that you are allowed to serve?" was answered, you must be twenty-one years old to become an officer. There is no set retirement age. It is based on the amount of years for retirement."

I liked this interview very much because this experience helped me to decide what career to go into after I graduate from high school.

MATH PROBLEMS********** Policemen

1. Each Police Officer makes $5.45 an hour for 48 hours worked each week. Any hours worked over the 48 hours the pay rate is time and one half. Last week Officer Lawrence worked 56½ hours. Officer Gay worked 53½ hours. How much more money did Officer Lawrence make last week than Officer Gay?

2. Reading the odometer on the police cruiser, the starting mileage for Officer Foster is 87159. When he finished his shift, the odometer read 87279.

   Knowing that gasoline costs $1.46 per gallon and the cruiser gets 20 miles per gallon, how many miles did Officer Foster travel and what was his bill for gasoline?

3. If a vehicle travels 60 miles in one hour, how far does it go in one second?

4. If the police car needs to be tuned up four times a year and needs new tires twice a year, plus the car drives 32,000 per year, what is the total yearly cost of operation?

   Tune ups $82.50, tires $275.00 and the car gets 18 MPG (gas is figured out at $1.35 a gallon).

5. Mrs. Kennedy the police secretary, types 49 W.P.M. If she is typing a 32 page report with approximately 320 W.P.M. how long will it take her to type the report?

School Principal

WISCASSET MIDDLE SCHOOL
WICASSET, MAINE
04578
PHONE: 882-7767

MICHAEL DONAUE
GUIDANCE DIRECTOR

ROBERT T. PAUL
PRINCIPAL

by Jeff Emmons and
Chris Hobbs

Mr. Paul is the Principal of Wiscasset Middle and Primary Schools. He is a very busy man being in charge of both schools. He works at least eight hours a day and has to attend quite a few meetings at night.

The primary responsibility of his job is to be the administrator of the two schools. He has to make sure students and teachers are relatively happy, and that everything in the schools functions properly. A big part of his job is preparing a budget for the schools.

In order to qualify to become a principal, a person must teach school for at least five years and have a Masters Degree. One of the biggest skills Mr. Paul told us he uses is personal relations.

We asked him if he received personal satisfaction from his job and he said, "absolutely, I really enjoy it!"

The main way Mr. Paul uses Math is in preparing the budget, and in figuring accumulative averages.

The following problems are typical math problems which Mr. Paul needs to do in his everyday work. The figures used are actual 1980-1981 budget figures.

1. If the total daily membership of our school is 104,325 for the year, and the total days present of all students is 98,867, what is the yearly percentage of attendance?

2. The proposed textbook account was $11,682.36. The School Committee instructed it to be cut by 8%. How much would then be proposed for the budget?

3. There are 597 students in our school. If there are 326 girls, what percentage are boys?

4. The last dance of the year will cost $365.00. The Student Council will pay 75¢ per student, with those attending paying the balance. How much will each student have to pay if 215 attend?

5. The total elementary school budget this year is $1,488,341.69. If $650,940.89 is spent for teacher salaries, $159,330.24 is spent for bus service, and $179,986.12 is spent for plant operation, how much is spent on other items in the budget?

6. If the average reading grade for grade six students is 7.2 this year and the average reading grade for grade five students was 6.4 last year, what is the reading growth of these students?

Plumber

by Warren Cossette

I am going to interview Bill Cossette for our Math book report. Bill is a plumber who works in Wiscasset. He's been doing this work for eighteen years.

I asked him quite a few questions about being a plumber. He works usually 8-10 hours per day and said a plumber can make between $15,000 and $16,000 per year. One of his fringe benefits is he can take a break from work anytime he wants, but usually he doesn't take many breaks. He said he really likes his job and likes being in different buildings and places all the time. He doesn't mind the travel too much. His family helps out quite alot on big jobs, although he works alone most of the time. He uses math in his work to figure out pipes and how they fit, ect. He told me it's a good career for young people to think about.

I enjoyed the interview and got a great deal of information about being a good plumber.

THESE ARE TYPICAL MATH PROBLEMS A PLUMBER MIGHT HAVE TO SOLVE

1. A plumber installed a water tank which was cylindrical in shape. If the tank was 4.5 feet high and had a diameter of 2 feet, how many cubic feet of water could the tank hold.

2. A plumber told Mrs. Clark that her well and pump would produce 4.5 gallons of water per minute. How much water is this a second, an hour?

3. A house 24' by 40' is heated by baseboard hot water heat. The plumber knows that he must run copper pipe from the furnace in the cellar, at one end of the house, all around the house. He also knows that there will be 10 heating elements and that each element needs 5 feet of pipe to rise from the sub floor to the heating element and retrun. How much copper pipe should the plumber order?

4. If the pipe in #3 above costs $1.65 per foot, how much will the materials cost just for the heating system?

5. The plumber estimates that it will take him 23 hours to plumb the heating system. At $12.50 per hour, what will the bill be for labor?

Architect

ARCHITECT-Bill Thompson
by Matt Gordon

I asked Mr. Thompson the following questions about his job. "What does an architect do?" "An archetect meets with people who would like a house designed. You try to design the house the way they want it and in the place they have chosen for their house. Then you watch over the building process to make sure it's going according to plans". He also told us his job can be extremely complicated although you try to make it simple as you go through the different stages.

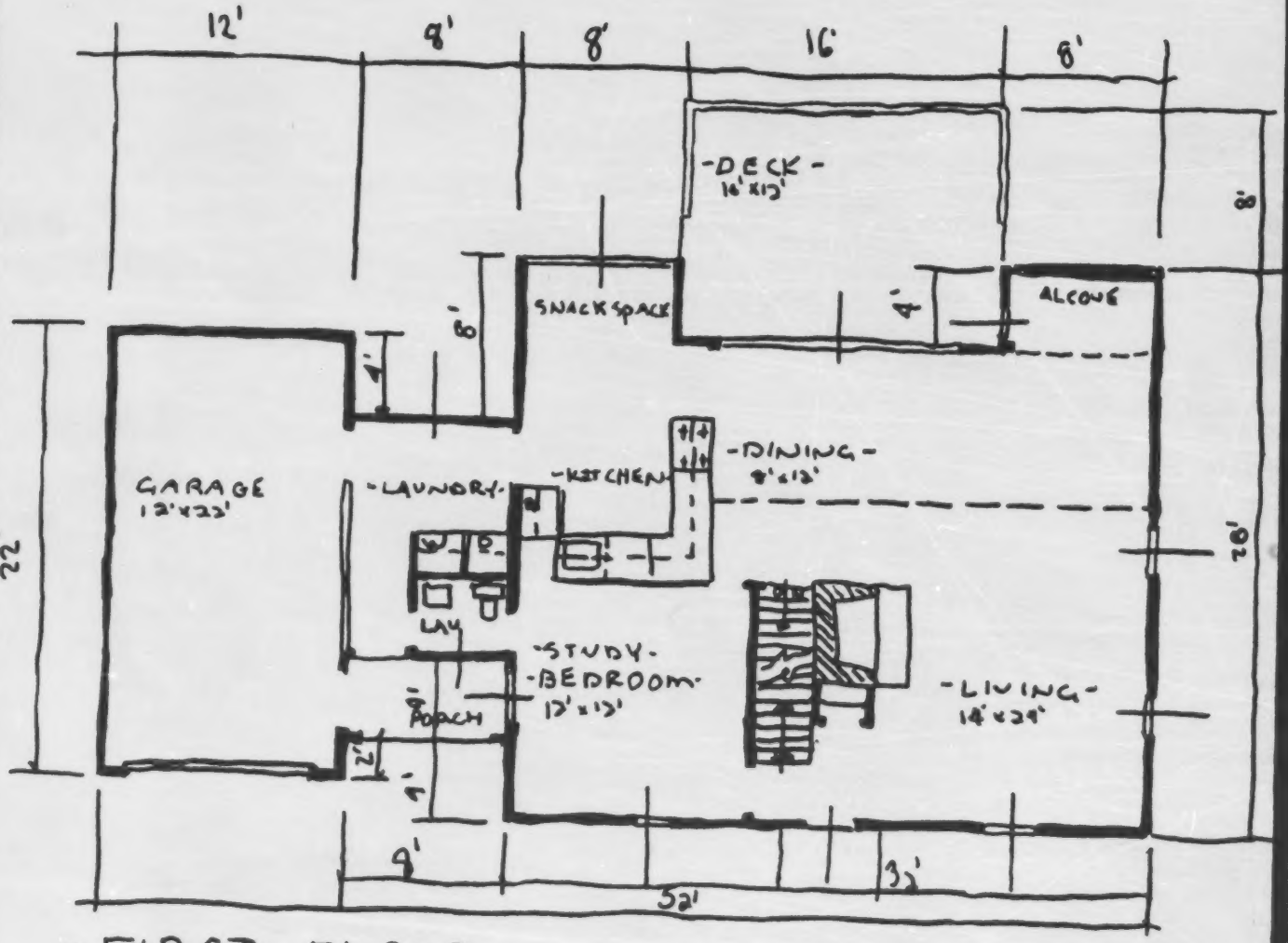
When I asked Mr. Thompson if he liked his job he said it was ¼ enjoyment and $\frac{3}{4}$ hard work, but even as hard as it can be you try to enjoy it. He told me that he has to travel a couple of times a month, but he prefers to be home. To be an architect you have to spend four years in college and three years in graduate school. Most beginning architects are at least in their mid-twenties when they begin practicing as a full fledged architect.

There are advantages and disadvantages in being and architect. Some advantages of the job are that you have something to show for what you are doing, you meet some very interesting people, and you make the ladnscape better than you found it. Some disadvantages are things don't always come out the way you planned and the cost of construction is getting beyond the means of the average person.

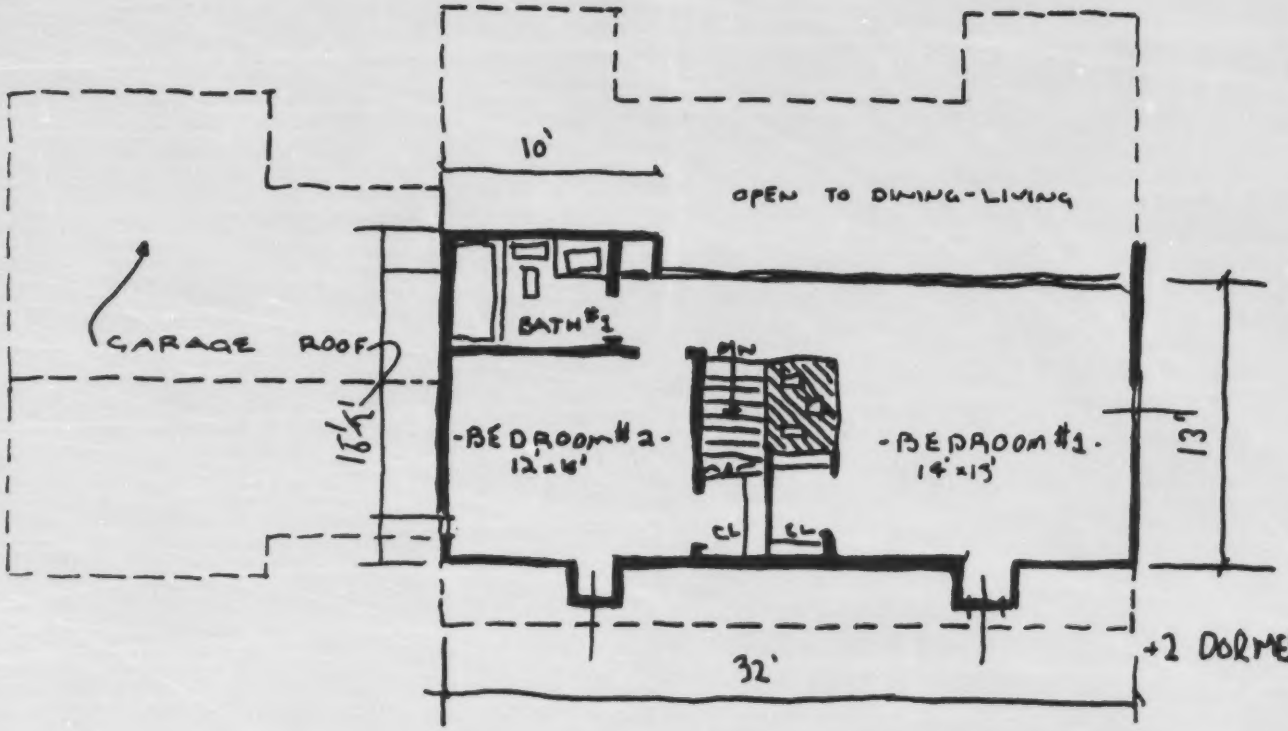
When business is bad are people with your skills needed? "No, not really unless you convince them that what you have to offer is something that will improve their situation in bad economic times." You can do other jobs, like teaching or lecturing and most important try to improve

By: Dale Grant

11



-FIRST FLOOR- 925 SQ. FT.



+2 DORMERS @ 6 SQ.FT. EACH

SCALE: 1/8" = 1'-0"

- SECOND FLOOR -

345 SQ.FT.

16

17

the environment. In terms of salary architecture isn't the best paying of jobs, but it does produce a satisfactory income for the average family.

I think this interview was a fun thing to do. Things went smoothly and I enjoyed it. Mr. Thompson's job sounds great and he is very good at it. I have seen some of his work and it's very good.

ARCHITECTUAL PROBLEMS----------Problems for the preceding pages.

1. What is the area enclosed by the ground floor (1st) excluding the garage and the porch?

2. What is the area of the second floor living space?

3. What is the area of the garage, rear porch (deck) and entry porch?

4. With an average ceiling height of 7½ on both floors. What is the cubic volume of floors 1 and 2?

5. If building costs average $40.00 per sq. feet for enclosed areas and $20.00 for garage and porches, what would be the cost of this house?

Psychologist

by Donald Moon Chris Hobbs

Chris Hobbs and I interviewed Mr. Scott Lucus who is a psychologist. For our first question we asked him what his job mainly consisted of. Mr. Lucus replied that he usually talked with kids and tested them.

We asked him what kind of tools he used. He said, "Tests and Knowledge are the main tools."

We then asked Mr. Lucus how you get to be a psychologist. He replied that the education one would need is four years of college, four years of graduate school, and a year of internship. He also added that you're usually between 27-28 years old by the time you get all of your schooling done.

The part of his job that Mr. Lucus enjoys the most is talking with kids. The part he liked the least was all the paperwork involved.

Mr. Lucus pointed out the fact that you had to be located near a city because there is virtually no need for a psychologist in the country.

Chris then asked about related jobs a person could transfer to. Mr. Lucus said you could become a university teacher or you could work in a hospital.

We asked Mr. Lucus if being a psychologist was easy or hard. He replied, "It's easy for me."

He said you have to like people and you can earn up to $100,000 dollars in this field.

Mr. Lucus gets a one month vacation each year.

Overall being a psychologist seems like a pretty decent job once you get out of school!

WORD PROBLEMS FROM A SCHOOL PSYCHOLOGIST**********

1. If a psychological evaluation costs $175 and a small town has six evaluations performed each year, how much should they budget for evaluations for one year?

2. At the end of third grade, Jane's reading level was 3rd grade. At the end of fourth grade, her reading level was 5th grade, 2nd month. How much did she gain in reading in fourth grade?

3. Using the following chart, how much did John gain in 5th grade science? (months) How much from grade five to grade eight?

John

SCIENCE LEVEL	Gr. 4	Gr. 5	Gr. 6	Gr. 7	Gr. 8
	4-8	5-9	6-4	7-2	9-4

4. The following page has tables which are used to convert scaled scores to I.Q. scores. Figure out the following peoples I.Q. scores.

Mary	Performance	55
	Verbal Score	60
Al	Verbal Score	71
	Performance	60
Phyllis	Performance	35
	Verbal Score	52
Jane	Verbal Score	40
	Performance	38
Tim	Verbal Score	51
	Performance	70

*Performance Score
Verbal Score
Full Scale Score

(Full Scale= Scaled Performance and Scaled Verbal)

I.Q. EQUIVALENTS OF SUMS OF SCALED SCORES

VERBAL				PERFORMANCE			
sum of scaled scores	IQ	Sum of scaled scores	IQ	sum of scaled scores	IQ	sum of scaled scores	IQ
39	86	54	105	35	78	53	104
		55	106	36	81	54	105
40	87	56	107	37	82	55	106
41	88	57	108	38	84	56	108
42	90	58	109	39	85	57	109
43	91	59	111	40	86	58	111
44	92	60	112	41	87	59	112
45	94	61	113	42	88	60	114
46	95	62	114	43	90	61	115
47	96	63	115	44	91	62	117
48	97	64	117	45	92	63	118
49	98	65	118	46	93	64	120
50	100	66	119	47	95	65	121
51	101	67	120	48	96	66	123
52	102	68	122	49	98	67	124
53	103	69	124	50	100	68	126
		70	125	51	101	69	128
		71	125	52	102	70	129

IQ. EQUIVALENTS OF SUMS OF SCALED SCORES

FULL SCALE

Sum of Scaled Scores	IQ	Sum of Scaled Scores	IQ
74	81	105	102
75	82	106	103
76	83	107	104
77	84	108	105
78	84	109	105
79	85	110	106
80	85	111	107
81	86	112	108
82	87	113	109
83	87	114	109
84	88	115	110
85	89	116	111
86	89	117	112
87	90	118	112
88	91	119	113
89	91	120	114
90	92	121	115
		122	116
91	92	123	116
92	93	124	117
93	94	125	118
94	95		118
95	96	126	
96	96	127	119
97	97	128	120
98	98	129	121
99	99	130	121
100	100		122
101	100	131	
102	101	132	123
103	101	133	123
104	102	134	124
		135	125
			126

IQ. EQUIVALENTS OF SUMS OF SCALED SCORES

FULL SCALE

Sum of Scaled Scores	IQ	Sum of Scaled Scores	IQ
74	81	105	102
75	82		
		106	103
76	83	107	104
77	84	108	105
78	84	109	105
79	85	110	106
80	85		
		111	107
81	86	112	108
82	87	113	109
83	87	114	109
84	88	115	110
85	89		
		116	111
86	89	117	112
87	90	118	112
88	91	119	113
89	91	120	114
90	92	[illegible]	
		122	115
91	92	123	116
92	93	124	117
93	94	125	118
94	95		118
95	96	126	
96	96	127	119
97	97	128	120
98	98	129	121
99	99	130	121
100	100		122
101	100	131	
102	101	132	123
103	101	133	123
104	102	134	124
		135	125
			126

Physical Therapist

by Debbie Grover

The life of a Physical Therapist, as Nancy Sherman puts it, is a fun one. She takes her job very seriously and loves every minute of it. She claims that it feels nice to know that you're helping someone; getting them on their feet again. And that's exactly what she does.

Nancy says you have to take some high school and college courses like: biology, physics, chemistry, and a couple others. You have to keep going back to school to freshen up on some new techniques the doctors may have come up with. She says that it's interesting though, to keep learning new things.

Nancy also says that Physical Therapists average about $10,000 to $15,000 a year (people that are just getting into the business). People that have more experience make about $20,000 to $25,000 a year.

Some of the tools used in a Physical Therapists jobs are: wheelchairs, crutches, whirlpools, hot tubs, and braces. These are used to aid the people back to normal.

WORD PROBLEMS****PHYSICAL THERAPIST

1. If a person is unable to walk and has to stay in a wheelchair, he will need a ramp to get in and out of his house. If the rise from the ground to the to the door is 4' how long should the ramp be? (General rule--ramp should be 1" length for every inch of height).

2. It is important to know about angles in order to set up a pulley exercises systems. Name three types of angles.

3. If a doorway is 29" wide and a wheelchair is 26" wide plus 2" on each side for hands, will a person be able to push himself through the doorway? Explain.

4. If the length of a person's room is 20' and he can walk up and back 4 times before tiring; what is the length of this person's ambulation tolerance?

Lobsterman

by: David Roderick
George Dodge

Mr. Sommers, who teaches grade 5, is a lobsterman in his spare time and during the summer. When he is fishing, he works at least 8 hours a day from early morning to noon. He works on a boat and needs to know how to operate the boat as well as work with special fishing tools.

Mr. Sommers says that a lobsterman needs a basic education because he needs to have good skills. You need to be able to weigh and measure the lobster so he can tell if it is a "keeper". It also helps to know basic math when ordering trap stock, selling the days catch, figuring your income tax, and even navigating the boat.

Mr. Sommers fishes on the Sheepscot River. He likes his job. In fact, that's the way he relaxes from his teaching job.

MATH PROBLEMS

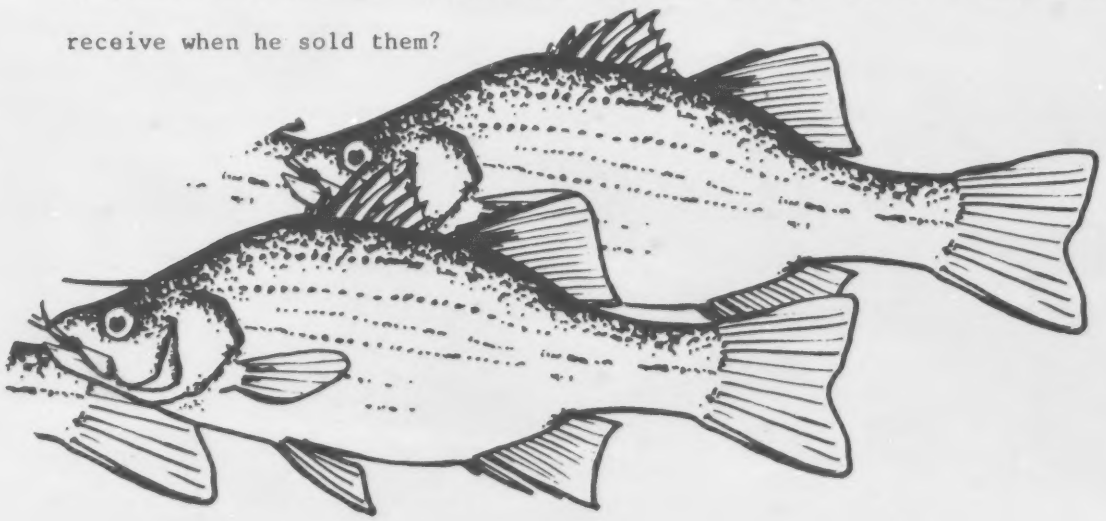
1. Mr. Sommers is buying forty new wire lobster traps. Twenty-five of these are three-foot supers which cost $25.75 each. Also 15 four-foot supers which cost $35.25 each. How much money, including tax (5%) will the traps cost?

2. Mr. Sommers needs pot warp for his forty new wire traps. He fishes all his traps as pairs with 10 fathoms between each pair. From his tail trap to the surface he needs 18 fathoms. How many feet of pot warp will he have to buy? (Hint 1 fathom= 6 feet).

Who Gets The Fish?

3. Mr. Sommers is buying lobster bait. If it sells for $3.75 per bushel and the salt he needs to keep it fresh costs $5.00 per bag, how much will be the total cost of 45 bushels of bait and salt? (Hint 1 bag of salt for 5 bushels of bait).

4. Mr. Sommers caught 45 pounds of lobster on Monday, 54 pounds on Tuesday, 34 pounds on Wednesday, 56 pounds on Thursday, 74 pounds on Friday, and 47 pounds on Saturday. If lobster were $1.95 per pound, how much did he receive when he sold them?



5. Mr. Sommers picks an average of two and a half pounds of crabmeat per hour. If it sells for $3.75 per pound, how much is he making per hour, per day, and per (40 hour) week?

High School Art Teacher

by Ricky Owen and Jeff Santos

Mr. Chase is an Art teacher at Wiscasset High School. In order for a person to be an Art teacher, he needs to go to high school, college, and take special art courses. Anyone wanting to make a career in art must also possess special talents and abilities.

Mr. Chase works about eight hours a day on weekdays. Not only does he work days, but he must also work at night.

Mr. Chase works with math in mechanical drawing and photography classes. The Metric System is used now instead of the Standard System. Mr. Chase uses math a great deal when measuring liquids. A great deal of logic is also used in his work.

One big disadvantage with being a teacher, is working with a student who doesn't want to learn, goofs around, and causes trouble. Other than that, a teacher's life is okay. It can be very rewarding.

The following problems are typical math related problems which occur in movie making, mechanical drawing, art, and photography.

1. What is the fastest way to find the exact center of a piece of paper?

2. In centering, enlarging and reducing mechanical drawings or photographs, it is important to be able to double or half fractions fast in your head. What is a simple rule to remember in doing this? Make up at least 4 examples to illustrate your rule.

3. How is it possible to divide a line (a paper, board etc.) into any number of equal parts without measuring?

4. If line A is perpendicular to line B and line C is perpendicular to line A, what is the relationship of line B to line C?

5. If it takes you 1 second to take 1 step, and if you could cover ½ the distance from school to your house in the first step, and ½ the remaining distance in the next step, and ½ the remaining distance in the third step etc,. how long would it take you to get through the front door?

6. What are the number combinations that tell exactly where on earth your house is located?

7. After comparing the differences between the Fahrenheit and Celsius Temperature measuring systems, is it possible for both systems to read the same at some temperature?

8. If movie film is always projected at 18 F.P.S. (frames per second) for normal speed action, and you want to make a slow motion movie of a runner sprinting for 1 minute, how many frames must you shoot in a variable speed camera to slow the action of the runner to half his actual speed when projected? How long will it take to shoot, and how long will it take to project?

Dentist

By Tina Merservey
Debbie Koughan

Our interview was with Dr. Balla, a new dentist working in Wiscasset. We did this interview because we are helping to write the math book.

We asked Dr. Balla if he liked his job. He told us he loved his job. He loves his work because he is always working with people. We then asked Dr. Balla how long it takes to becaome a dentist. He said that you need four years of college and then four years of dental school. He also told us that you must take a long test that proves you are qualified to treat people.

We asked Dr. Balla how long it took him to begin his own practice. He told us he got a professional loan when he wanted to start his practice. This took a matter of six months. During a typical week he works 45-50 hours per week. Not all of that work is treating patients. A lot of it is in the lab.

Lots of our friends have braces so we asked about these. He said they are sometimes necessary, but many people get them to improve their looks. We also asked about needed equipment. He uses nechanical scalers and electric toothbrushes. He told us a person should get a check up at least once or twice a year. The one thing he doesn't like about his job is the paper work. During his first year of practice, he didn't make any money because he had to put it back into the business.

Many people are nervous when they go to the dentist. With children, he uses laughing gas, and with adults, he just tries to talk with them to calm them down.

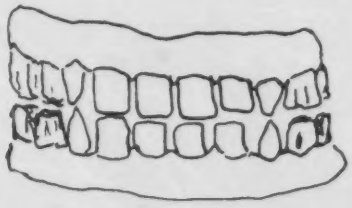
We really enjoyed our interview with Dr. Balla. He was very nice and we learned a lot. We had never done anything like this before. It was fun.

It costs approximately $30,000 to equip and start a new business.

1. If all of this capital is financed at 18% interest over a five year period, what is the monthly payment?

2. The cost of rent for business office space averages $1.00 per square foot. If an office has a layout of 1,000 square feet, what is the monthly fee for this service.

3. Some of the other expenses, such as electricity, phone service, employee salaries, might run as high as $1,000 per month. Determine the monthly break even point, using the data in questions 1, 2, and 3.



4. If a doctor works the following schedule: 8 a.m. to 9 p.m. Monday with two hours off, 8 a.m. to 5 p.m. Tuesday through Friday with one hour off each day, and 8 a.m. to 1 p.m. Saturday. How many hours does he work per week?

5. If a doctor works in his office an average of 4.3 weeks per month, determine (using data in questions 3 $ 4) how much would it cost per hour to keep that office operating.

Recreation Director

by Jeff Santos
Danny Crocker

Mr. Brewer is director of the Wiscasset Recreation Department. The department runs a variety of different programs for young people and old. Mr. Brewer has been doing this job since May of 1979 and says he has really enjoyed his first two years.

In order to be a recreation director, Mr. Brewer graduated from the University of Maine at Farmington in 1977 with a B.A. and a coaching certificate. He then went on to Springfield College where he got a Masters Degree in Health and Physical Education. He told us he really likes his job because he likes working with kids. His average working day is 6 hours a day and one or two hours at night, during the summer he works at least ten hours a day.

Mr. Brewer uses math in his job mainly to figure out the yearly budget and to figure what to charge people. It really sounds like a neat job and it's something both of us might want to do.

MATH PROBLEMS FROM THE WISCASSET RECREATION

DEPARTMENT

1. A regulation size soccer field has the following dimensions: length--100 yards, width--50 yards, and the goal is 24 feet by 8 feet. If the Rec. Dept. wishes to scale down a field for use in Midget Division of the Youth Scoocer Program, and they have a length of 150 feet, how wide should they make their field? Also, if their goal is 5 feet high, how wide should they make their goal?

2. The Wiscasset Youth Soccer Program Budget from 1980 was $600. Consider the following facts: each palyer must be supplied with shin pads which cost $3.15 each and a jersey which costs $6.00 each. The program is broken up into three divisions with 4 teams in the Midget Division, 6 teams in the Junior Division, and 4 teams in the Senior Division. Each game must have one referee who is paid $4.50 per game. The Rec. Dept. already owns shin pads for 100 and jerseys for 120 participants. The 1980 program has 160 participants and the recreation departments anticipates a possible growth of 15% in the number of participants. Each team in the Midget division will play 8 games. Each team in the Junior Division will play 12 games, and those in the Senior Division will play 8 games. Assuming they can get an area merchant to sponsor each team with sponsorship cost being $50.00, field maintenance and supplies will be $50.00, maintenance labor cost will be $30.00, publicity and registration forms will cost $30.00 and there is no charge to participants, how much should they appropriate for the 1981 Soccer Program?

3. The Wiscasset Recreation Department wishes to start a new program titled "Aerobic Dance Class" for women. The class will last for 10 weeks with one class per week on Monday night for one hour. They Anticipate an enrollment of 50 woment. The Rec. Dept. will assume all costs for publicity and informational materials. The Rec. Dept. policy states that all adult specialty programs be self-supporting. What should the Wiscasset Recreation Department charge each women enrolled in the "Aerobic Dance Class"? The instructer must be paid $16.00 per hour.

   They anticipate an enrollment of 50 women. The Rec. Dept. will assume all costs for publicity and informational materials. The Rec. Dept. policy states that all adult specialty programs be self-supporting. What should the Wiscasset Recreation Department charge each women enrolled in the "Aerobic Dance Class"? The instructer must be paid $16.00 per hour.

Waitress

by Melissa Jones

I am interviewing Freda Jones for a school project.

I asked her what she does for work, she said she waitresses and does ceramics. I asked her if both jobs were easy or hard and she said they were both hard. Next, I asked her if she liked her jobs, and she said she did. She liked them because she gets to meet new people. Freda likes ceramics best.

When I asked her how she got paid she said, "I get paid weekly." She doesn't get paid holidays or vacations.

I asked her if she had holidays off, and she said she only got four a year. The days off were Christmas, Thanksgiving, the 4th of July, and Labor Day.

When I asked Mrs. Jones if she worked everyday she said, "I work as a waitress four days a week, and on ceramics two days a week." Mrs. Jones waitresses Monday through Thrusday each week and does ceramics Fridays and Saturdays.

I asked if she worked nights or days and she said days on waitressing, and nights on ceramics.

I asked her if she worked the same hours and what they were. She said, "4:30 am to 1:30 or 2:00 pm."

The following are typical math problems that a waitress might have to do on her job.

1. Shirley works a four-day week. She gets paid $2.25 per hour and works 7 hours a day. She makes $24.75 a day in tips. How much does she make in tips altogether?

2. A man buys one cup of coffee which costs 35¢. He also buys a B.L.T. which costs $1.25 and a piece of custard pie that costs 60¢. How much is his total bill?

3. Mr. Johnson owes the restaurant a bill of $30.00. He pays $5.00 per week. How many weeks will it take him to pay his entire bill?

4. If Jane makes $2.50 an hour for a four day week, nine hours each day plus $27.20 in tips each day, how much does she make each week? How much would she make in a month? How much would she make in one year?

5. Dr. McCarthy owns a restaurant in Boothbay Harbor. He must project his average weekly cost over the summer. If his seasonal budget is $217,000 how much is his average weekly cost going to be if the season is 21 weeks?

6. The special for the day is chili and beans which costs $2.25 per serving to the customer. If 39 servings are sold and the cost to the restaurant is $1.10, how much does it cost the restaurant, and how much does the restaurant make for profit?

Travel Agent

by David Greenleaf
Greg Sutter

Being a travel agent is a very busy job. They help people go on vacations, travel for business, and do all sorts of travel planning. In Bath a lot of travel arrangements are made for B.I.W. and the sailors on Navy ships. During the winter they get lots of business from people who want to go south, but they also get summer business from people who want to come to Maine.

Some people, when they get back from a nice trip, decide to become Travel Agents themselves. To be a Travel Agent you don't need a license, but you should go to special school to really understand the job and do well. It is a very detailed job; you must be well organized and alert at all times. Lots of young people become travel agents because it is exciting and they get to go on some trips. A Travel Agent cannot come and go as they wish, but usually get 3 or 4 trips per year.

In a typical day Lynn McNelly (she's the lady we interwiewed) works 8 to 10 hours. She told us that it is a neat job to be able to arrange all these trips to far away places. She was arranging a trip to Germany the day we met with her. Greg and I decided that a trip to Bermuda would be really nice so we picked up lots of material on going there.

Even though you don't make lots of money doing this job, it's still the kind of job that would be exciting and something we both might want to do.

Here are some typical Math problems, Mrs. McNelly gave us, that a Travel Agent would have to do.

1. If the total cost of an airline ticket from Portland, Maine to Houston, Texas is $554.00 including a 5% sales tax, (1) What is the base fare? (2) What is the tax?

2. If Round the World Travel receives 9% commission on the base fare only for the Portland to Houston ticket, what is the dollar amount of the commission that the agency receives?

3. A family of 4 (2 adults, 1 child 10 yr. old and 1 child 14 yrs.old) plan to make a trip to Disney World in Orlando, Florida. Following the chart below, compute the total cost of roundtrip airfares for the entire family.

Portland/Orlando	1-Way	Adults	$149.00
		Child	$ 85.00

(Children 12 years old and older pay full adult fare)

4. Two clients book reservations to fly from Boston to St. Thomas, U.S. Virgin Islands and return. One client wants only air fare as they will be staying with friends in St. Thomas. The other client wants a complete tour (Air, Hotel & Transfers). Based on the following, compute the commission received by the agency for each client's booking.

Air Fare Only	$458.00 Roundtrip @ 8%
Air fare & Tour	$353.00 One Way @ 11%

MORE MORE MORE MORE MORE MORE MORE MORE MORE MORE MORE MORE MORE MORE

MATH PROBLEMS MATH PROBLEMS MATH PROBLEMS MATH PROBLEMS MATH PROBLEMS

5. A couple want to vacation over a long weekend in Montreal, Canada. They have booked reservations at the Bonaventure Hotel at the rate of $90.00 per night (U.S. Money). The hotel requires a one night deposit to hold the reservation, but requests the deposit funds. The rate of exchange is 15%. How much will the agency pay the hotel for the one night deposit is Canadian funds? Where does the agency go to get a check or money order in Canada funds, at the best rate of exchange?

6. A client buys a one-way airline ticket from Portland to Boston and on to Los Angeles, paying $374.00 for the ticket. He finds a friend who is driving to Boston and would like company on the drive, therefore, he does not fly from Portland to Boston, only from Boston to Los Angeles. When he arrives in Los Angeles, he takes his unused ticket to the airline for a refund. Based on the fact that the airline will refund only the difference between the cost of the Boston to Los Angeles ticket he used and the price he paid for a thru Portland/Los Angeles fare, what will the passenger receive for a refund?

Portland/Boston/Los Angeles Thru Fare	1-Way	$374.00
Portland/Boston	1-Way	$ 49.00
Boston/Los Angeles	1-Way	$363.00

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Bath, Maine 04530

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MORE TRAVEL AGENT MATH PROBLEMS

7. Mr. & Mrs. Stone plan to spend two months in England this summer. It is important for them to plan their budget early and to exchange American money to British pounds. If one dollar will buy .45 pounds, how many pounds can they receive for $1,250.00 American Dollars? $1,250.00 is their total budget, plus $598.00 each for round trip air fare. How much (in pounds and dollars) will they spend on the trip?

8. Mr. Donahue, the school Guidance Counselor, would like to attend a three day conference to be held in Detroit next year. He must plan the expected cost one year ahead of time. If airfare is $299.00, the hotel is $55.00 per night, meals are $75.00, how much should he budget for the conference? Remember, airfare is expected to go up 18%, hotel 15%, and meals 20%. Registration remains the same.

9. A client buys a airline ticket from Portland, Maine to Houston, Texas and return to Portland, Maine using a thru fare which does not allow for any stops enroute to or from. He flies from Portland to Houston, but on the return he decides to stop in Boston to visit a friend. When he goes to the airline ticket counter in Boston, he finds he must pay an additional amount. Based on the following what is the amount he must pay the airlines?

Portland/Houston/Portland		$554.00
Portland/Houston	1-Way	$277.00
Houston/Boston	1-Way	$265.00
Boston/Portland	1-Way	$ 49.00

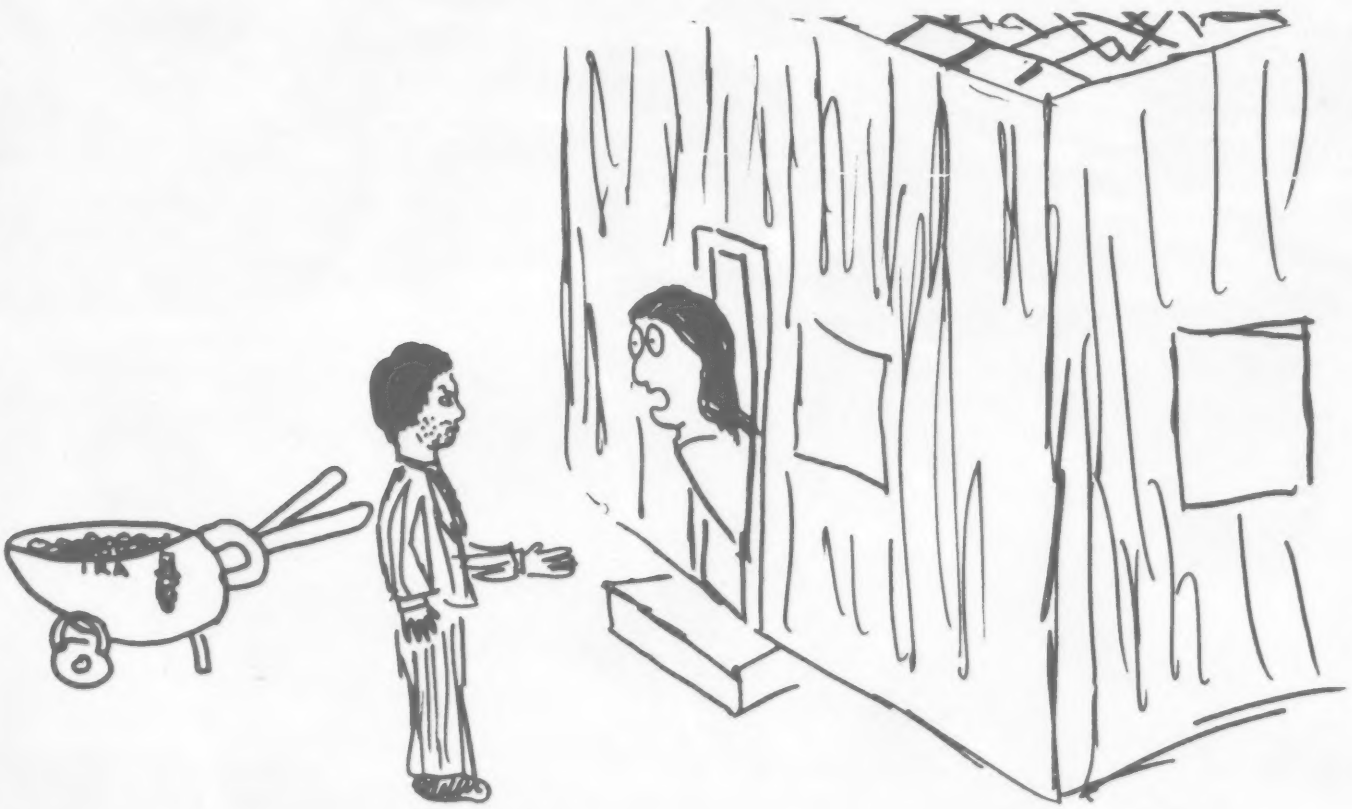
Tax Collector

by Jenny Fisher

Dianne Hawthorne is tax collector and excise tax collector for the town of Wiscasset. She had to run for this job, and was elected at town meeting in March. She works part time, 20 hours a week, and earns $4500.00 a year.

You do not need a college degree for her job, but you do need a high school diploma. If you wanted to do this job, you should take Math, Business, and Typing courses in high school. You need to be able to use adding machines, ledgers, and cash boxes.

Mrs. Hawthorne likes the satisfaction of meeting and helping people.



WORD PROBLEMS

1. Karen Lisbon has to pay $380.00 in taxes. She gets ½ of 1% discount if she pays within 30 days. If she pays within 30 days how much less will she have to pay?

2. Mr. and Mrs. Adams have to pay $560.00 in taxes. They have to pay by a certain date or they will be charged 3/4% per month interest. If they wait two months after the time limit, how much interest will they have to pay.

3. Find the totla and ½ of 1% discount

Map & Lot	Taxes		
	Real Estate	Personal	Total
#316	$370.00	$25.00	

4. Find the total and interest to be paid if payment is 3 months late. (Use rate as 3/4% per month).

Map & Lot	Taxes		
	Real Estate	Personal	Total
#317	$425.00	$150.00	

Potter

by Kevin Jordan
Jenny Fisher

Mr. Green makes and sells pottery and old books. He likes making the pottery the best because he likes to work with clay. Mr. Green works mainly with things; a kiln, potters wheel, and clay. Ideas are important because a potter must know what kind of things to make and how to go about making them.

Mr. Green depends upon his work for his family income. An advantage to this job as Mr. Green said, "Since I work for myself, I can decide when to work and when not to work. He also said self-discipline is hard."

Mr. Green works on the average six or seven hours a day. He taught himself everything and picked this craft up by himself. He did not have any schooling. He reads a great deal and practiced.

He uses his hands as a main tool. Mr. Green also uses kilns, scales, cutting tools and wheels. He uses math to make glazes, to make change, to work with money, and when measuring ingredients on a balance.

A potter could make enough to live on but it depends on how good the person is, how much money he earns. By putting in time and effort, a good potter, such as Mr. Green, can get a great of personal satisfaction.

MATH PROBLEM********* P. L. Green Pottery

1. A basic glaze recipe is:

Feldspar	4700	grams
barium carbonate	1100	grams
whiting	2300	grams
kaolin	2000	grams
flint	1500	grams
zircopax	1300	grams

Different colors are produced by adding:

green	copper oxide	5 %
brown	red iron oxide	8%
blue	cobalt oxide	2 %
light blue	cobalt oxide	0.5%

How many grams of each should be added to the batch to produce each color?

2. A book gives the following glaze recipe:

Feldspar	3800	grams
whiting	2200	grams
zinc oxide	280	grams
flint	1200	grams
kaolin	1900	grams

The containers available to mix glaze in have a capacity of 5000 grams, so the recipe must be scaled down to fit. What is the recipe to be followed?

3. A customer buys 96 vases to sell in his gift store. Each vase cost $6.50, but in a lot of a dozen 15% discount is given. How much should this customer be charged?

MORE MORE MORE MORE MORE MATH PROBLEMS****** P. L. Green Pottery

4. Sometimes test glazes are made in 100 gram batches. If a glaze test well, a full batch is made. The following is the formula of a successful test glaze:

Feldspar	52	grams
flint	16	grams
dolomite	8	grams
barium carbonate	14	grams
tin oxide	7	grams
rutile	3	grams

What weights of each ingredient would be necessary to make a full 5000 gram batch?

5. There are 28 grams in an ounce. Some reference books give weights of glaze ingredients in pounds, but it is necessary to convert pounds to grams since the scale used measure in grams.

Convert the following glaze formula to grams:

Feldspar	6.5	pounds
flint	3.0	pounds
dolomite	2.25	pounds
kaolin	2.0	pounds
zircopax	2.0	pounds
zinc oxide	0.75	pounds
black copper	0.25	pounds

Administrator

by Paul Green

The interview we are doing is with Mr. Don McCobb who is the Assistant Superintendent of Schools for union number 48.

Mr. McCobb has to do many jobs to keep a school system in operation. One of the major jobs he does is setting up a suitable budget. Many things have to be approved by the school officials that it will affect. The school board of this particular town must approve it, the teachers must like it, as well as many others.

Mr. McCobb has to take care of the hiring and firing of the staff at all of the eight schools he works with. He also has to keep teachers needs in mind for working out problems they might see as large in a system.

Many times he has to go to a school board meeting for a certain town and help them present well-thought plans for the revitalization of current plans of action the school might utilize.

WORD PROBLEMS****Mr. McCobb-Assistant Superintendent

1. $9,975 is 5% more than last years salary. What was last years salary?

2. A person's salary contract provides for an annual increase of 5% for each of the first 10 years of employment. For this year there is an added 10% increase due to inflation. What is the total annual salary increase for the person for this year?

3. The state pays towns a subsidy based on a formula which subtracts the town's property valuation times a mil tax rate from the total anticipated cost of education for the town. For town "A" the valuation is $14,000,000 and the mil tax rate is .00925 and the anticipated cost is $288,873,67. What is the state subsidy?

4. Several children are transported to a school in private transportation. The driver must drive 50 miles to transport them for one trip and charges 18¢/mile plus $3.35/hour. The trip takes 1½ hours. The children live in towns and at distances from school as listed:

STUDENT	DISTANCE	TOWN
Mary	10 miles	A
John	8 miles	A
Henry	12 miles	B
David	13 miles	C

If the bill is proportioned by miles, what is each town's share?

5. A worker's pay is $4.25/hour. He receives time-and-a-half over 40 hours. How much money does he receive for working 50 hours?

Town Clerk

by Dale Hodgdon

This interview is being done for our math book project. Mrs. Hodgdon, besides being my mother, is town clerk for the town of Westport Island, Maine. It takes a very organized person to do this job. She keeps records of all town meetings, elections, births, marriages, deaths, and issues dog licenses.

According to Mrs. Hodgdon, her job is fairly easy, but very time consuming. You only make about $800 a year. For the past eighteen years she has been doing this job. She has to be able to type and has to attend special classes to keep up with the changes in the law pertaining to elections and other state & town laws. She is especially busy at election time.

Being a town clerk would be a good part-time job. The only time one is busy is when elections for selectmen come up and during state and national elections.

So that's what a town clerk does.

MATH PROBLEMS FROM MRS. HODGDON-TOWN CLERK

1. If there are 350 voters and for election there needs to be 55 ballots ordered for every 50 voters, how many ballots would need to be ordered for an election?

2. The town clerk was traveling to a meeting for 2¼ hours at an average speed of 54 miles per hour. How many miles did she travel?

3. There are 365 enrolled voters on Westport Island. 219 voted on election day. What percentage voted? If the total population of the Island was 630, what percentage of the total population voted?

4. Young David Greenleaf wanted to get tags for his dog. The total cost is $8.50 and David gets a weekly allowance of $1.50. How many weeks must he save to pay for the dog tags?

5. Mark Bodmer wants to get a series of licenses to get married, go hunting, register his dog, go fishing, and pay the excise tax on his new Corvette. Marriage licenses are $5.00, hunting $6.00, fishing is $6.00, and excise tax is $167.00. Mark has $179.00 to spend on licenses. What will he have to wait to pay? If you were Mark, what priorities would you put on these liceses?

Real Estate Agent

by Chris Hobbs
Mark Bodmer

Mr. Farmer is a real estate agent in Wiscasset. He runs his own agency. Primarily he lists and sells property to other people, which at times can get pretty complicated. To be a real estate agent Mr. Farmer told us you have to complete a certified real estate course and there is no age requirement.

We asked him about the advantages of being a real estate agent and his response was, "It's a good way to make a living. The disadvantage is that you can be on call 24 hours per day."

He works within a 20 mile radius of Wiscasset and advertises in newspapers and magazines. He was not very optimistic when we asked how a young person can buy a house. He replied "It's tough when you don't have a down payment, but Farmers Home loans can be helpful."

Math is very important in figuring out sales contracts and percentages.

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Statewide Commercial

Roy E. Farmer, REALTOR — Res. Phone (207) 882-7329
Conrad H. Peters, REALTOR — Res. Phone (207) 372-8844

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Real Estate Math Problems

1. A person desires an insurance policy to cover a dwelling in the amount of $60,000 on an "All Risk Basis" in the town of Wiscasset. If the annual "All Risk Rate" is .42 per hundred, how much would the annual premium be?

2. A prospect asks for a quote for a policy to cover in the ammount of $47,500 on a dwelling in Wiscasset with an additional $5,000 covering personal property, both items to be covered for the perils of Fire and Extended Coverage. If the fire rate on the building is .20 per hundred, the first rate on contents is .28 and if the extended coverage rate .11 per hundred on both building and contents, how much will the annual premium be?

3. If a person buys a house for $42,500 and the bank is offering mortgages at 20% down for 30 years at 12.5% interest plus two points to the buyer and one point to the seller, how much will the seller and buyer have to pay at closure? How much will the bank loan the buyer at closure?

ONE OF MAINE'S MOST ATTRACTIVE SMALL ESTATES.

Nuclear Engineer

by Mike Haskell
Paul Green

Mr. Swartz is a nuclear engineer at Maine Yankee nuclear power plant. He works primarily in the engineering department and instructs non-liscensed operators. He's more of a teacher than anything else. His daily work schedule is about eight hours. He's been doing this job since 1965.

"I really like to work with the people and the duties around the plant can be very exciting," is what he told us is good about his job. What he sees as a disadvantage is that alot of people are against nuclear power and want to close Maine Yankee which would put him out of a job. Also working out schedules can be a big part of his job.

For the past year Mr. Swartz has been at Maine Yankee which he says is a good place to work. To be a operator he told us you need at least a high school diploma with some advanced training. Special tools are not needed except for teaching tools and understanding engineering thoroughly. There is a shortage of women in this field. The math used can be very complex. He gave us some examples of how math is used.

Energy and Nuclear Power

After the interview with Mr. Swartz, we asked him for some basic math problems he might face in a day of work at the power plant.

Here are examples of algebraic equations Mr. Swartz might have to solve:

1. $x + 7 = 17$

   $x =$

2. $x^2 + 4 = 40$

   $x =$

3. $10^x = 150$

   $x =$

4. $x + y = 17$

   $2^x + 3y = 37$

   $x =$

   $y =$

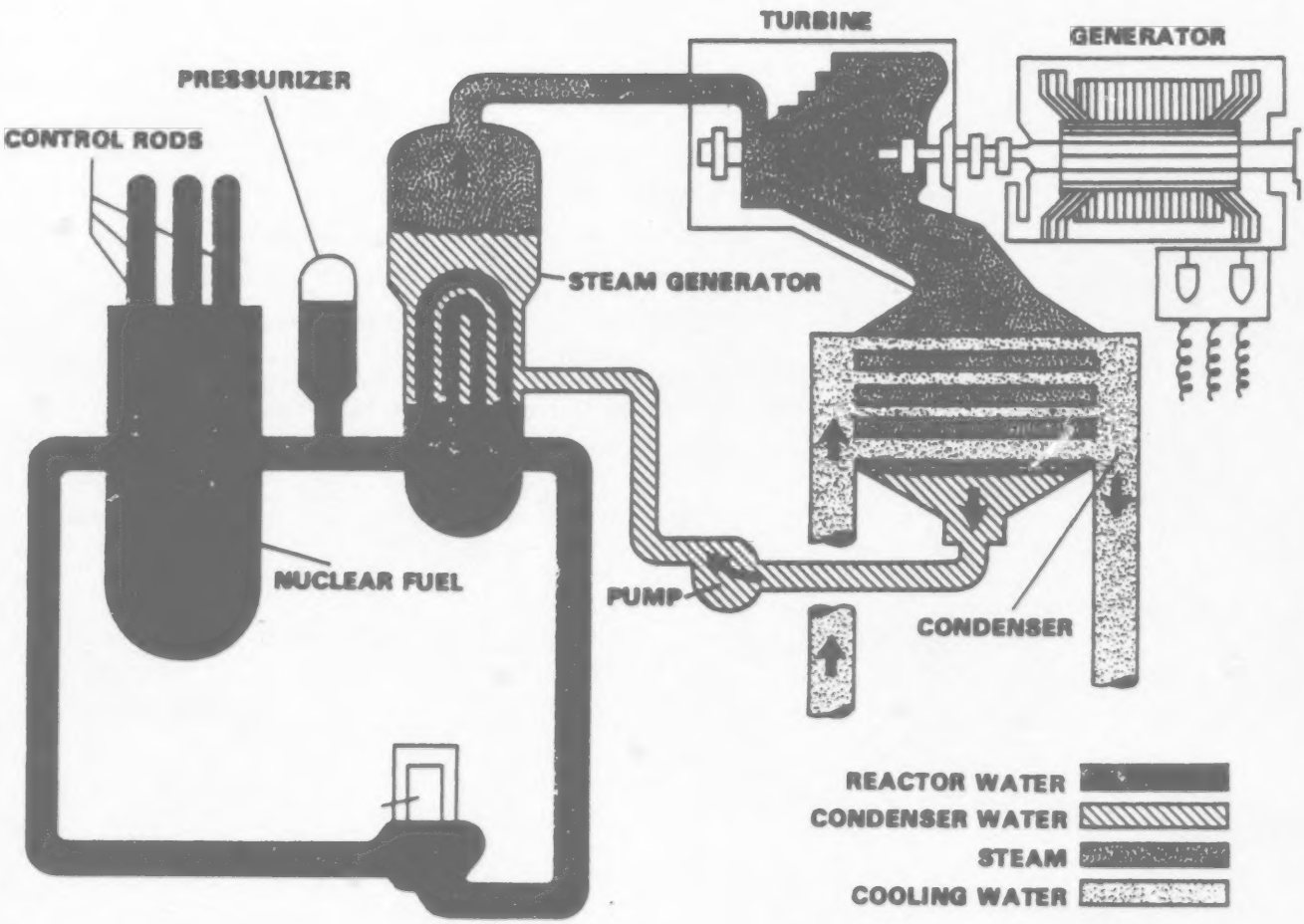
5. $x^o =$

6. $(x + 3)^2 = 36$

7. $100 = 10 (10^{2x})$

MAINE YANKEE

How MAINE YANKEE works



Chemical Supervisor

by Jeff Santos
Randy Rogers

John Stevens is the Chemical Supervisor at Maine Yankee Nuclear Power plant in Wiscasset. He has been working at Maine Yankee since October of 1970, so he is starting his eleventh year. This was his first job choice when he completed school. He has a degree in chemistry from University of Rhode Island. He told us extra special training is also needed by many of his workers and himself.

Mr. Stevens has three other chemists and two technicians to help him do the work at the plant. One of the major things they do is direct the chemistry of the primary and secondary systems. They run tests on all the water the plant uses and continually check the work that the operators do.

According to Mr. Stevens most of the math they do at the plant is Algebra. If problems come along that are very difficult they use the computer. He liked math and got B's in all his math courses.

When he was asked about the money he gets, he said that he makes good money for Maine standards, probably more than a lot of other chemists in Maine. He also said that he could get a job just about anywhere because chemists are in big demand.

Mr. Stevens works about forty four hours per week and since he has been at Maine Yankee for over ten years, he gets five weeks of vacation time.

MORE MORE MORE MORE MORE MORE MATH PROBLEMS MORE MORE MORE MATH PROBLEMS MATH

****

1. The Refueling Water Storage Tank (RWST) has a maximum capacity of 350,000 gallons of water. Presently it contains 116,000 gallons of water containing 1740 PPM (post/million) of Boron. Determine how many gallons of 6.25% Boric Acid solution to add prior to diluting took to 350,000 gallons with demineroliyid water to obtain a final concentration of 1740 PPM.

Given = 1 gallon of water = 8.34 lbs.

Step 1 - Determine the number of pounds of Boron required to produce a 50,000 gallon solution containing 1740 PPM

Definition: PPM = milligram/liter
or
= 1 lb of solute/10^6 lb. of Solvent

a 1740 PPM solution would be equivalent to 1740 lbs of Boron in 1,000,000 lbs of water.

Set up the following ratio to determine step 1.

$$\frac{1740}{160} = \frac{X}{350{,}000 \text{ gal.} * 8.34 \text{ lb/gal}}$$

"SOLVE FOR X"

Step 2 - Determine the number of pounds of Boron in the original solution. (116,000 gallons of 1740 PPM Boron.)

$$\frac{1740}{160} = \frac{\quad}{350{,}000 \text{ gal.} * 8.34 \text{ lb/gal}}$$

"SOLVE FOR X"

Step 3 - Determine the number of pounds of Boron that must be added.

Final lbs-Initial lbs = lbs to add.

"HOW MANY POUNDS MUST YOU ADD?"

STEP #4 - Determine the number of PPM Boran in a 6.25% Boric Acid (gal.)

Given: Boric Acid contains 17.5% Boron or

$$\frac{B}{H_3BO_3} = .175 \text{ or } 17.5\%$$

Given: A 1% solution by weight contains
10000 PPM/(mg/e)

. . A 6.25% sol'n would contain 62500 PPM
In terms of Boron
X=62500 * . 175 =

"SOLVE FOR X"

STEP # 5 - Determine the # if lbs. of Boron per gallon of Boric Acid.

$$\frac{10937.5 \text{ lb}}{10^6 \text{ lb}} * 8.337 \text{ lb/gal.} = 0.091186 \text{ lb/gal.}$$

. . each gallon of 6.25% H_3BO_3 contains 0.09186 lbs. of Boron

STEP # 6 - Determine the number of gallons of 6.25% Boric Acid to ass
From STEP #3 we need 3395.8 lbs. of Boron

. . $\frac{X= 3395.8 \text{ lbs.}}{0.09186 \text{ lbs/gal}}$

"SOLVE FOR X"

Guidance Counsellor

by Jayne Manson Pam Sproul

Mr. DeBlois is the new guidance counselor at Wiscasset High School. His major job is to help troubled kids. He first got interested in this job when he was a teacher in Brunswick, Maine. He saw all the problems many kids had and decided he would like to help. To become a Guidance Counselor in Maine, you must first teach at least two years and have a Masters degree in Counseling or Psychology. It takes four years of college, at least two of teaching, and another year or two of college to become a Guidance Counselor. Last year he worked at a large high school in the Portland area to learn more about being a Guidance Counselor.

During a typical work day, Mr. DeBlois works 8 to 9 hours a day and usually one or two nights per week with meetings or talking with parents. He gets the same vacations as the students except he works one week before and one week after the school year.

Some tools he uses on his job are achievement tests, books, and himself. He primarily works with people. He likes individual counseling best, but finds that the worst part of the job is all the paperwork. He is in charge of running all the Pupil Evaluation Team meetings. It's really nice to have a person around for all the kids to talk to, but the demand is so great that there isn't enough of him to go around.

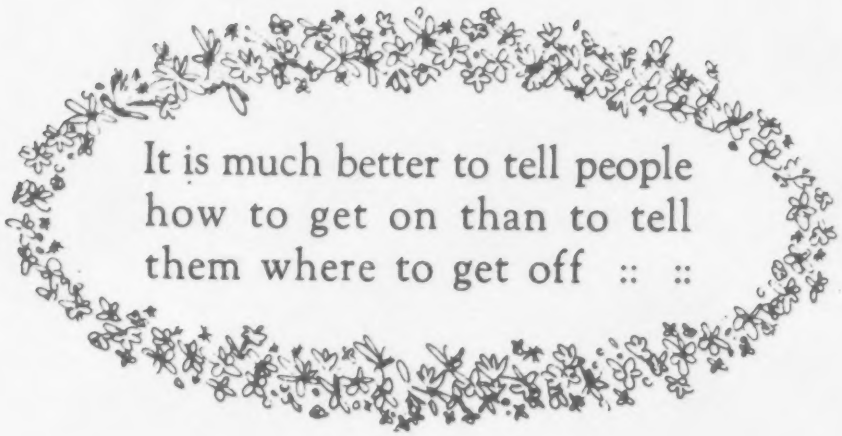
MATH IN THE GUIDANCE OFFICE MATH IN THE GUIDANCE OFFICE

The basic math computation that we do in the guidance office is the determination of a student's Grade Point Average (G.P.A.). This is based on a system where an A=4 points, B=3 points, C=2 points, D=1 point, F=0 point. This is done by a simple average. However, before averaging the credits we must divide the point per course by the amount of credit given. For example; English is worth 1 credit, if a person gets a B in English we divide the points for the course (3 pts.) by the credit given 1=3 points. Physical education on the other hand is only given ¼ credit, if a person gets a A-4 points we divide that by ¼=1. After each course has been tallied, we add up the total number of points and divide by the credits attempted and this gives us the G.P.A. Example: John's ranks for the 1 st quarter are: English B, Science B, Social Studies C, Math A, P.E.A. Credit Eng. 1, Sce. 1, S.S. ½, Math 1, P.E. ¼.

English	3	1 Credit
Science	3	1 Credit
S.S.	1	½ Credit
Math	4	1 Credit
P.E.	1	¼ Credit
Total	12 points	3 3/4 =G.P.A.

$\frac{15}{4} \div \frac{12}{1}$ = 3 1/5 or

G.P.A. = 3.20



GRADE POINT AVERAGE PROBLEMS:

Five different students need their G.P.A determined. Using the formula previously explained figue out each person's G.P.A. (English = 1 Credit, Science = 1, Math = 1, French = 1, Industrial Arts = 1, Home Economics = 1, Social Studies = ½, Physical Education = ¼.)

Barbara	Sam	Eric
English C	English A	English D
Math C	Math B	Math D
Science A	Science B	Science C
S. Studied B	S. Studies A	S. Studies A
French B	Home Ec. B	I.A. C
P.E. C	P.E. A	P.E. B

Sarah	Jane	Mr. Woodcock
English D	English C	English F
Math A	Math B	Math B
Science A	Science B	S. Studies D
S. Studies C	S. Studies	French D
I.A. A	French C	I.A. C
P.E. D	P.E. A	Latin D
		P.E. A

Newspaper Editor

Bath/Brunswick

Jeff Bebe is the Times Record Editor. His job is to assign reporters to stories, monitor the reporters time and work, tells them what to do and what not to do. His main job is laying out and designing the Bath and Brunswick pages in the paper.

Mr. Bebe went to the University of Maine and studied journalism, and graduated with a Journalism Degree. He was the Editor of two weekly papers in Old Town and Ellsworth. In his college and high school paper he was also the editor. Mr. Bebe said that the money he makes is not bad and compared it to a carpenter's check.

Mr. Bebe also talked a great deal about how math is used by editors. He spend two years working for Russell Wiggins, former editor of the Washington Post.

The Times Record

The "type area" of a page of The Times Record is comprised of six columns of type, each 15 picas wide. Each colum is separated by a one-pica gutter. Thus, the full page width is 6 X 15 plus 5, or 95 picas. When different columns are used, or when columns are boxed, the total wisth must always equal 95 picas.

A. How wide would each column be in a five-column format?
95 Picas-4 ½icas (four gutters between columns) equal 91.
91 Picas divided by 5 equals 18.2 picas.

B. How wide would each column be in a five-column <u>boxed</u> feature?
95 Picas minus 6 picas (four gutters plus 2 margins between outside columns and the box) equals 89 picas.
89 picas divided by five equals17 picas and 10 points.

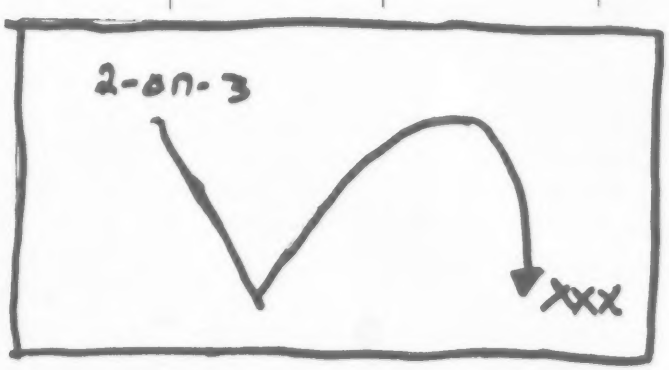
In figuring colums widths, always maintain the one-pica gutter between columns, and one-picas margin inside the box.

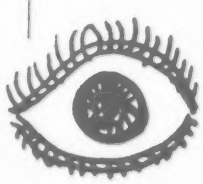
1. How wide would the type be in a one-column box?

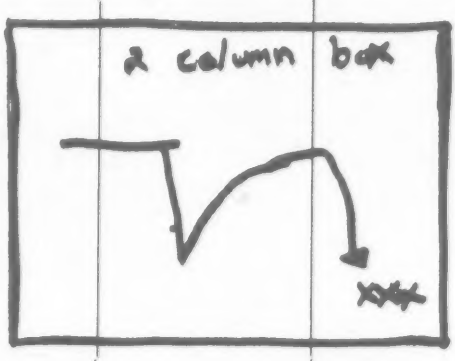
2. How wide would each column be in a two-column box?

3. In a three-column box?

4. How about each of the two columns in a three-column box?

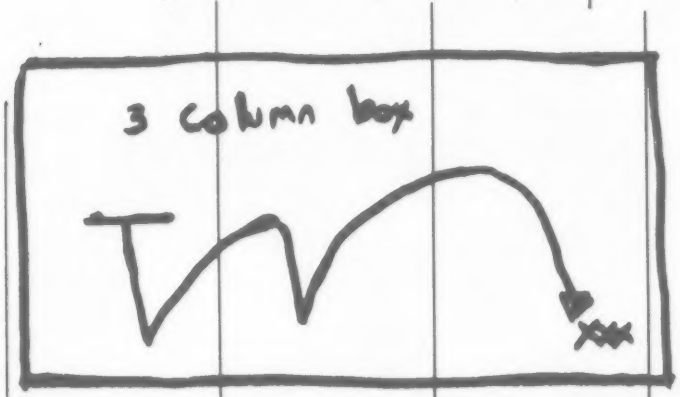


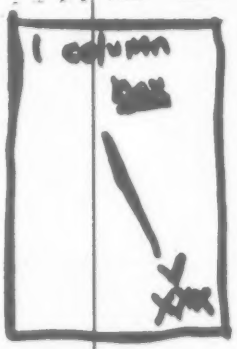




The Times Record

Using the formula for optimum line length, minimum line length, and maximum line length, compute the optimum, minimum, and maximum, for the following type face:





With 18-point type:

5. Could we layout a six-column page?
6. Could we layout a four-column page?
7. A three-column page?

With 14-point type:

8. What would be the fewest number of columns we could use across a page?

With 9-point type:

9. Fewest number of columns across a page? Maximum number ?
10. And how wide would each column be in each case?

DON'T FORGET: FULL PAGE WIDTH MUST ALWAYS TOTAL 95 PICAS

The Times Record

In a standard Times Record six-column format, compute the widths for each size photograph, one through six-columns wide.

11. 1-col;
    2-col;
    3-col;
    4-col;
    5-col;
    6-col;

Using a three-inch-high, five-inch wide borderless snapshot, what would reproduction percentage be for each column width, and how deep (in inch) would each photo be? (Always round percentages upward.)

Example C. 1 column: 30 picas reduced to 15 picas: 50 percent.
Depth: 50% of 3 inches equals 1½ in.

(When some foolish editor does that, we say "Only the government is allowed to print postage stamps, you fool.)

12. Figure percentage and depth for two columns, 3, 4, 5, and 6
13. Now figure the same if the picture were to be used vertically
14. (What's the widest we could run it, given our 21½-in page maximum depth.)

Just for fun:

Would the following headlines fit their assigned measures?

6-48-1

Wiscasset students complete math textbook project.

6-48-1

Wiscasset students complete mathematics textbook project.

2-36-2

Wicsasset Middlers finish
math textbook

3-48-3

Students' textbook testimony:
We're 'numbed by numbers' Would it fit 2-30-2?

1-36-3

5-48=1

Student text finds math 'everywhere' Would it fit 1-30-3? 3-36-1?

Lawyer

by Anne Proctor
Tanya Bickford

David Soule is a lawyer with an office in Wiscasset.

As a lawyer, David mainly does divorce work, real estate, and some probate work. Probate work consists of settling estates after people have died. Mr. Soule does not do criminal work.

Mr. Soule's favorite part of his job is working with people. He says that being a lawyer has a very human aspect to it. You have to listen and understand people's problems before you can start to help them. You should be a sympathetic listener.

A lawyer needs four years of college, and three years of law school. In law school, you mainly research cases to see how certain judges interpreted them. More than anything else, law school teaches you a logical way of thinking like a lawyer. When you finish law school, you take an exam called the bar exam. You have to pass it to become a lawyer. The bar exam takes close to two full days, but in different states the exam varies. David has taken the exam in Massachusetts and in Maine.

After law school and passing the bar exam, a lawyer can start his practice right away. In this area a lawyer who is just starting out will make from $12,000 to $16,000 a year. After that, the amount grows, but it depends what area you are in and how much demand for your type of law there is. Mr. Soule charges $50.00 an hour.

The math in law is usually in dealing with estates and doing deeds. A lawer's secretary will often do his math for him on some sort of calculator or adding machine. The secretary needs to know basic math because

some lawyers also do income tax work.

Law isn't really seasonal work. The Real Estate Business is heaviest in the spring and early summer, and income taxes around income tax time, Divorces and other cases can come at anytime.

Costs for services vary, but if the lawyer thinks a person can't afford his rates, he may lower the cost.

David Soule's father is also a lawyer. He encouraged David to choose any career he wanted. David wanted to be able to stay in Maine, be his own boss, and provide a good living for his family. So he tried law, and found that he really loved it.

If he had to choose again, Mr. Soule said that he would still be a lawyer. Mr. Soule's favorite subjects were Geometry, English, and the sciences. In college, he majored in political science and minored in biology, art, and a small amount of other sciences.

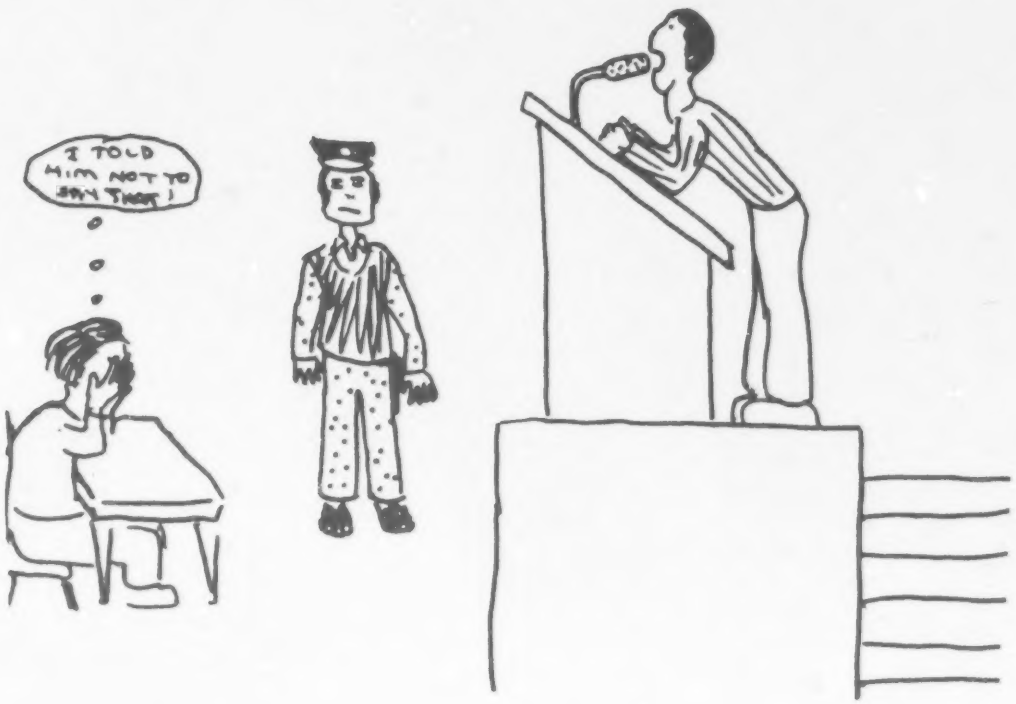
David works mainly with people and ideas, the ideas being the other person's, not his own. He works with these ideas and tries to make them happen.

"Law doesn't really include that much math," Mr. Soule told us, "It's mostly the thinking process you acquire after doing math for a long time.

Mr. Soule doesn't think a computer could ever takes his place. He says that they would be a very big help in running an office, but the feeling that only a human being can have are important in his job.

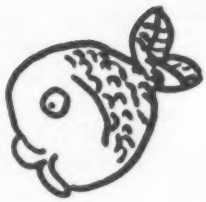
There is a large demand for lawyers right now. The divorce and crime rate is high, and lawyers have a great deal of work. But sooner or later Mr.-Soule thinks that there will be too many lawyers. "Eventually, lawyers won't have the workload they have now. I'm afraid that there just may be too many. But that's quite awhile in the future, so I'm not too concerned about it right now."

Interviewing a lawyer was very interesting, and we really learned alot. Mr. Soule was very easy to talk to, and this really helped us to be able to be less nervous and ask better questions. Law seems like a really interesting field for the right type of person. You have to be able to listen to problems and give the best anwser you can. Also, you can't let it get you down too much if you couldn't help a person. If you fit this description, law may be a very good job for you.



The taxes on a piece of property are $350 and the property is being sold in the middle of the tax year. The principals want the split the cost so that the seller pays 3/4 and the buyer pays 1/4. What will each owe?

1. If the state imposes a tax of 5% on estates and the value of Mrs. Jones estate is $100,000, how much tax will be due?



Extra

Math Problems

LINGO LOGIC

The Permitz School of Languages has an unusual policy that helps keep its costs down: there are no instructors. Only bilingual students who wish to learn a third language are accepted, and the students teach one another.

One class which has just started consists of Sean, and five other young people. Two of the six speak Spanish; in fact, each language represented in class is spoken by two, and only two, of the students.

Gretchen, who does not speak Chinese, can communicate with both Ivan and Juan, although Juan does not speak English of German, Wong, who does not speak English of Russian, can understand Juan but not Louise who doesn't speak English or Russian either. Louise, who doesn't speak French, can converse with Ivan, who doesn't speak Chinese; neither speaks German.

Can you deduce which two languages are spoken by each student.

Mr. Woodcock

MORE MORE MORE MORE MORE MORE MATH PROBLEMS MORE MORE MORE MATH PROBLEMS
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1. Steve and Janet went to the liquor store to buy twenty-three bottles of champagne for their parent's wedding anniversary, at $5.00 a bottle plus five cents tax on a dollar, how much did it cost them?

   by Sue Barth

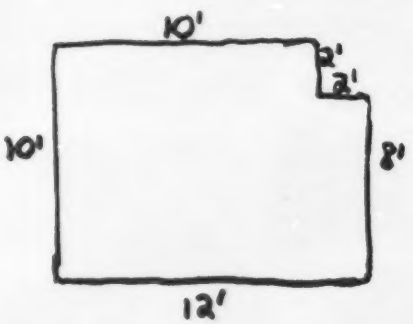
2. Jim has to buy carpet for part of his home. The upstairs bathroom is nine feet by five feet. The bedroom is twelve by fifteen with a closet three by five. The attic is going to be made into a rec room and only half will be carpeted. The whole attic is thirty-five feet by fifty-two feet. How much carpet would Jim need? At $15 per square yard, how much would this cost him?

   by Tanya Bickford

3. One Alka Seltzer tablet produces twelve square inches of gas. There are twenty tablets in one box. How many square feet of gas will one box of Alka Seltzer produce?

   by David Tonry

4. Mr. Smith needs to buy a new carpet ofr his living room. The room looks like this:



   If the store sells carpet by the square yard, how many square yards will it take for Mr. Smith to carpet his living room?

   by Chris Hobbs

MORE MORE MORE MORE MORE MORE MATH PROBLEMS MORE MORE MORE MATH PROBLEMS
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1. Sam and Joan went on a cruise in the Carribean Sea, they took with them $1000.50. They had already bought the tickets for their rooms. Sam bought some drinks at the bar one night which totaled $20.89. While he was at the bar, Joan went to the casino and spent $5.00, but won $26.50 while playing a one-arm bandit. How much money did they spend that one night on the cruise or how much did they make?

   by Matt Whitaker

2. Four pigmy hockey players entered the National Hockey League this season. Pigmy "A" had three goals in his first five games. Pigmy "B" had two goals in his first four games. Pigmy "C" had five goals in his first eight games. Pigmy "D" had six goals in his first ten games. If the pigmies kept scoring at this rate, how many goals would they end up with at the end of an eighty (80) game schedule?

   by Donald Moon

3. If you bought ½ lb. cheese one day, 3/4 lb. on the second day, 1/5 lb. for the next six days and 1 lb. on the last day. How much would you have in all?

   by James Cole

4. Mary went downtown and bought a shirt for $10.50, a pair of pants for $18. and four pair of socks for $1.00 each. When she got there everything was 50% off. How much did she spend?

   by Tara Hatch

5. The lumberman at Hunt's has to mix one pint of oil to every half gallon of gas when he puts it in his saw. If he had a tank that contained 20 gallons, how much oil would he have to put in?

   by Trevor Foye

MORE MORE MORE MORE MORE MATH PROBLEMS MORE MORE MORE MATH PROBLEMS
****

1. Sally Winston went to the Shawn's grocery store in Bath. She bought a pound of grapes for 35¢ a pound, three cans of green beans on sale three cans for one dollar, and a box of Tide for $2.50. Sally has a coupon for 35¢ off a box of Tide. How much change will she get back from a $20 bill?

   by Alicia Howard

2. Mr. Woodcock had to do some shopping for Mrs. Woodcock so he went up to the General Store. On the grocery list, there were these items: (1) three loaves of bread, (2) two dozen eggs, (3) three bottles of Rose' Wine, (4) three bottles of coke, (5) 1 lb. of hamburger, (6) 1 package of hot dogs, (7) two T-bone steaks, (8) 1 jar of peanut butter, (9) three bags of chips, (10) three containers of chip/dip.

   When he got to the store, he picked up all of the items on the list. His wife gave him a $50 bill to cover the cost. The total was $37.29.

   1). How much sales tax was there?
   Maine sales tax is 5%.

   2). After adding the sales tax, how much change did he receive?

   by Tom Deiley

3. There were 200 seats at the auditorium. 97 were eaten by the Phantom of the Opera, and 63 more were brought in. Then a Werewolf came and engulfed 93. If the chairs weighed 11.93 pounds each, how much weight did the Phantom and the Werewolf gain?

   by George Flanders

MORE MORE MORE MORE MORE MORE MORE MATH PROBLEMS MORE MORE MORE MATH
****

1. Mr. Woodcock makes a salary of $180.00 a week. Each week he spends $30 for food, $40 for a car payment, and $90 for a house payment. How much extra spending money will he have each week?

by Joey Dalton

2. John had a total of 1008 apples. He decided to go on a trip. If he ate four meals every day and ate 1 1/3 apples a meal, how many weeks would the apples hold out?

by Wanda Pearson

3. Jim's father owned 5 acres of land. On 1 1/2 acres of land he built a store. The rest of the land was split evenly between Jim and hes sister. How much land was left over from the store? How much will Jim and his sister receive?

by Scott Barnes

4. If Steve drives eighty miles an hour for eight hours in a circle that has a circunference of two miles, how many times will he go around? If his gas tank holds enough gas for forty miles, how many times will he stop to fuel up? How long will it take him if he stops 4 minutes each time?

by Steve Crommwell

5. John's mother told him to go to the store and pick up some groceries. She gave him ten dollars to spend. He had to get 3 bags of potato chips which were .79¢ a bag. He bought 3 packages of hotdogs for $1.10 a package, he got 4 packages of hot doh rolls at .69¢ a package. Did John spend too much money or did he have some left over? How much was left over or how much did he owe the store?

by Matt Gordon

MORE MORE MORE MORE MORE MORE MATH PROBLEMS MORE MORE MORE MATH PROBLEMS

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1. Kim has $25.00. She wants to spend it on a skirt and a couple other things for school. She buys a skirt for $17.32, a ruler-15¢, pencils $1.09, pen-$1.69, and a notebook-89¢. She wanted to know when she got to a candy shop if she'd have enough money for two candy bars at 27¢ each and a soda at 55¢. Will she have enough? If so, how much will she have left after buying the candy and soda?

   by Debbie Grover

2. Mr. Wong is driving his car at 50 m.p.h. In five hours how far will he have gone?

   by Scott Long

3. MENU

Sundae	$1.09	French Fries	35¢ sm 50¢ lg.
Triple Burger	1.18	Apple Pie	45¢
Soda sm. 43¢ med. 49¢ lg. 56¢		Coffee	30¢
coke		Milk	25¢
orange		Chicken Sandwich	1.35
tab			

   Last night Susan and Laura went to "Fred's Diner" for dinner. Susan had a chicken sandwich, a large order of fries, and a medium coke. For desert she had an apple pie and milk. Laura got a triple burger, a large tab, and a small order of fries. For desert she had a sundae and coffee. How much did everything cost without tax?

   by Kathy Walton

4. A plane has to go 2,600 miles to get to the airport. The plane is going about 200 miles an hour. In hours, how long will it take to get there?

   by Carl Urquhart

Credits

Editor - Jeff Santos

Assistant Editors - Paul Green
- Jayne Manson
- Pam Sproul

Artist - Donald Moon

Interviewers - Writers (listed by Career researched)

1. Administrator - Paul Green
2. Architect - Matt Gordon
3. Art Teacher - Rick Owen, Jeff Santos
4. Bath Iron Works - Paul Green, Jenny Fischer, Rick Owen
5. Chemical Engineer - Randy Rogers Jeff Santos
6. Clerk - Dale Hodgdon
7. Dentist - Debbie Koughan, Tina Meservey
8. Doctor - Sue Barth, Alicia Howard
9. Dress Shop Owner - Cindy Cumming, Wanda Pearson
10. Fisherman - David Roderick, George Dodge
11. Guidance Counselor - Jayne Manson, Pam Sproul
12. Lawyer - Anne Proctor, Tanya Bickford
13. News Editor - Jeff Santos, Jeff Emmons, Paul Green
14. Nuclear Engineer - Paul Green, Mike Haskell
15. Nurse - Karen Asdot
16. Plumber - Warren Cossette
17. Police Officer - Tom Deiley, Joey Dalton
18. Potter - Kevin Jordan, Jenny Fischer
19. Principal - Jeff Emmons, Chris Hobbs
20. Psychologist - Chris Hobbs, Donald Moon
21. Real Estate Agent - Chris Hobbs, Mark Bodmer

22. Recreation Director -
Danny Crocker
Jeff Santos

23. Restaurant Owner - Abby White,
Laurie Donovan

24. Secretary - Melissa Jones
Tina Meservey

25. Tax Collector - Jenny Fischer

26. Therapist - Debbie Grover

27. Travel Agent - David Greenleaf
Greg Sutter

28. Veterinarian - Greg Sutter
Jeff Emmons

29. Waitress - Melissa Jones